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THE IRON AGE

THE NATIONAL METALWORKING WEEKLY April 20, 1950

APR 20 1950

Flat-rolled finishing equipment

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SHEARING LINES
SIDE TRIMMING, SLITTING AND RECOILING LINES
LEVELING AND OILING LINES
CONTINUOUS GALVANIZING LINES
CONTINUOUS TERNE LINES
CONTINUOUS TIN LINES

Flat-Rolled Finishing has come a long way in the last 25 years. During this time, Aetna-Standard has worked closely with the industry's specialists in pioneering many new ideas, such as: continuous galvanizing, continuous terne lines, high speed shearing and classifying lines and backed-up Roller Levelers.

Through its many achievements and work with the industry, Aetna-Standard is regarded as the leader in the designing, engineering and building of Flat-Rolled Finishing Equipment.

THE AETNA-STANDARD ENGINEERING COMPANY
YOUNGSTOWN, OHIO
ASSOCIATED COMPANIES:
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HEAD, WRIGHTSON & COMPANY, LTD., THORNABY-ON-TEES, ENGLAND
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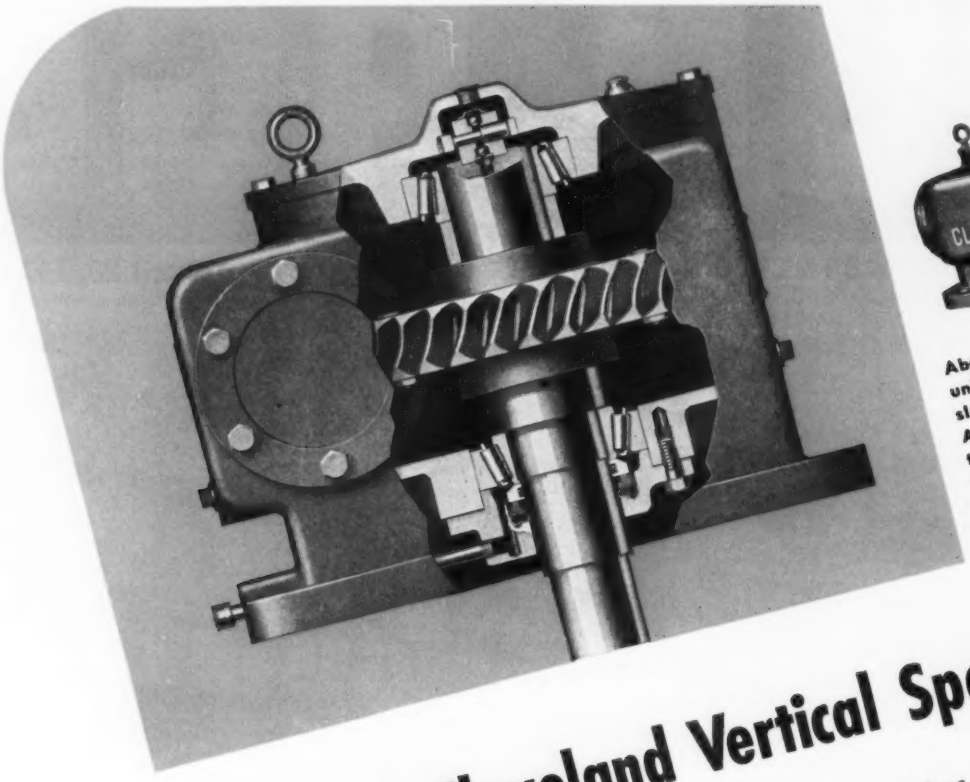

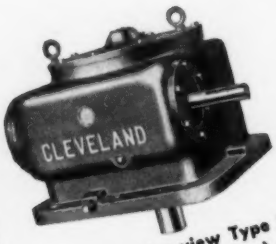

Above—Exterior view Type ND unit. NU unit (not shown) has slow-speed shaft extending up. At left—Cutaway section to show tapered roller bearings on gear shaft, positive face-type oil seal, unique lubricating pump and oil drain at base of housing.

A new series of Cleveland Vertical Speed Reducers

NU and ND worm gear units—in seven sizes each (50 to 500) are ready for prompt delivery. They are particularly suited to such equipment as agitators and mixers, and for use in connection with supplementary low speed spur gear drives, without outboard bearings.

Outstanding features which insure that these new vertical drives will deliver long and trouble-free service are:

Extra heavy tapered roller bearings on gear shaft.

Continuous lubrication of top bearing by positively driven pump mounted on upper end of gear shaft (on lower end in Type NU).

Positive face-type oil seal below lower gear shaft bearing to prevent leakage.

Heavy base flange extends around all four sides. All parts liberally oversized and precision built.

Write for Bulletin 125 for full description of Types NU and ND, including capacity charts and dimension data. The Cleveland Worm & Gear Co., 3252 East 80th Street, Cleveland 4, Ohio.

Affiliate: The Farval Corporation, Centralized Systems of Lubrication. In Canada: Peacock Brothers, Limited.

CLEVELAND
Worm Gear
Speed Reducers

BOOM OF MAYARI R LIFTS BIGGER LOAD

Building concrete structure with Bay City truck crane. The 85-ft boom and 15-ft jib were made from Mayari R.

Recognizing the positive sales appeal of a truck crane that could lift more payload and place it higher, Bay City Shovels, Inc., studied the effect of using booms built from Mayari R low-alloy, high-tensile steel. They tried these booms on their cranes and found them far superior to the shorter, heavier booms of plain carbon steel. As a result, Bay City truck cranes equipped with Mayari R booms are today cutting erection time and racking up profits for progressive building contractors.

Bay City found that Mayari R provided 3 distinct advantages:

1. Because of its higher yield point and tensile strength, Mayari R allows them to decrease the deadweight of their booms, with the same lifting capacity; or make them longer, or increase their lifting capacity, without increasing deadweight.

2. The superior properties of Mayari R enable the boom to withstand the deflections occurring in such structures.

3. Mayari R presents no fabricating problems in their shops. It is cut, drilled, punched, formed and welded by the same methods they use for plain carbon steel.

This versatile steel is now widely used in many types of construction equipment. For more information on the application of Mayari R in this field, write for a copy of Catalog 259.

BETHLEHEM STEEL COMPANY, BETHLEHEM, PA.

On the Pacific Coast Bethlehem products are sold by Bethlehem Pacific Coast Steel Corporation

Export Distributor: Bethlehem Steel Export Corporation

BETHLEHEM STEEL

Mayari R *makes it lighter... stronger... longer lasting*

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THE IRON AGE

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Special Issue

Featured this week is a special Metal Powder Issue devoted to the latest developments in the powder metallurgy fields. Technical articles include the adaptation of statistical quality control to the size of powder metal parts, plating, pickling and machining of precision powder parts and some of the newer products such as helical gears, parts with interior cavities, etc.

Issue Highlights

Statistical quality control has been installed by Ford Motor on the mass production of powder metal distributor bushings. The control methods by which the precise tolerances are now being met have cut rejections about 90 pct of that formerly experienced.—p. 83.

One of the most difficult operations on powder metal parts has been successful plating. Paul K. Scott, plant manager of Illinois Lock in Chicago, in this article describes a successful plating technique which eliminates the blistering difficulties encountered due to entrapped acid and cleaning materials. The conductivity of the part in the electrolytic solution is increased by prior copper deposits. Also, unusual in this case is the extensive machining, including broaching, which Illinois Lock performs on powder metal parts. —p. 87.

Eastern railroads are maneuvering to regain lost steel freight trade with lower carload rates proposed to the Interstate Commerce Commission. But highway haulers protest this threatens their existence and they are preparing for battle in the courts.—p. 103.

A large majority of employees of Inland Steel Co.'s Indiana Harbor works voted to pay part of the cost of their pensions under a contributory pension plan. Under a novel arrangement they voted for a choice of two types of plans. —p. 107.

The Industrial Reserve Review Committee has reported to the Munitions Board that dormant production facilities have weakened under government care. The Committee says office facilities have received more care than production facilities.—p. 111.

Coming Next Week

A Special Report concerning depreciation and its effect on the industrial plants of America will be featured in next week's issue. The three hurdles industry faces due to obsolete depreciation rules are: (1) Depreciation reserves are too small, (2) the Federal tax policy discourages machinery replacement and, (3) the industry lacks a well-planned program to offset obsolescence of plant and equipment.

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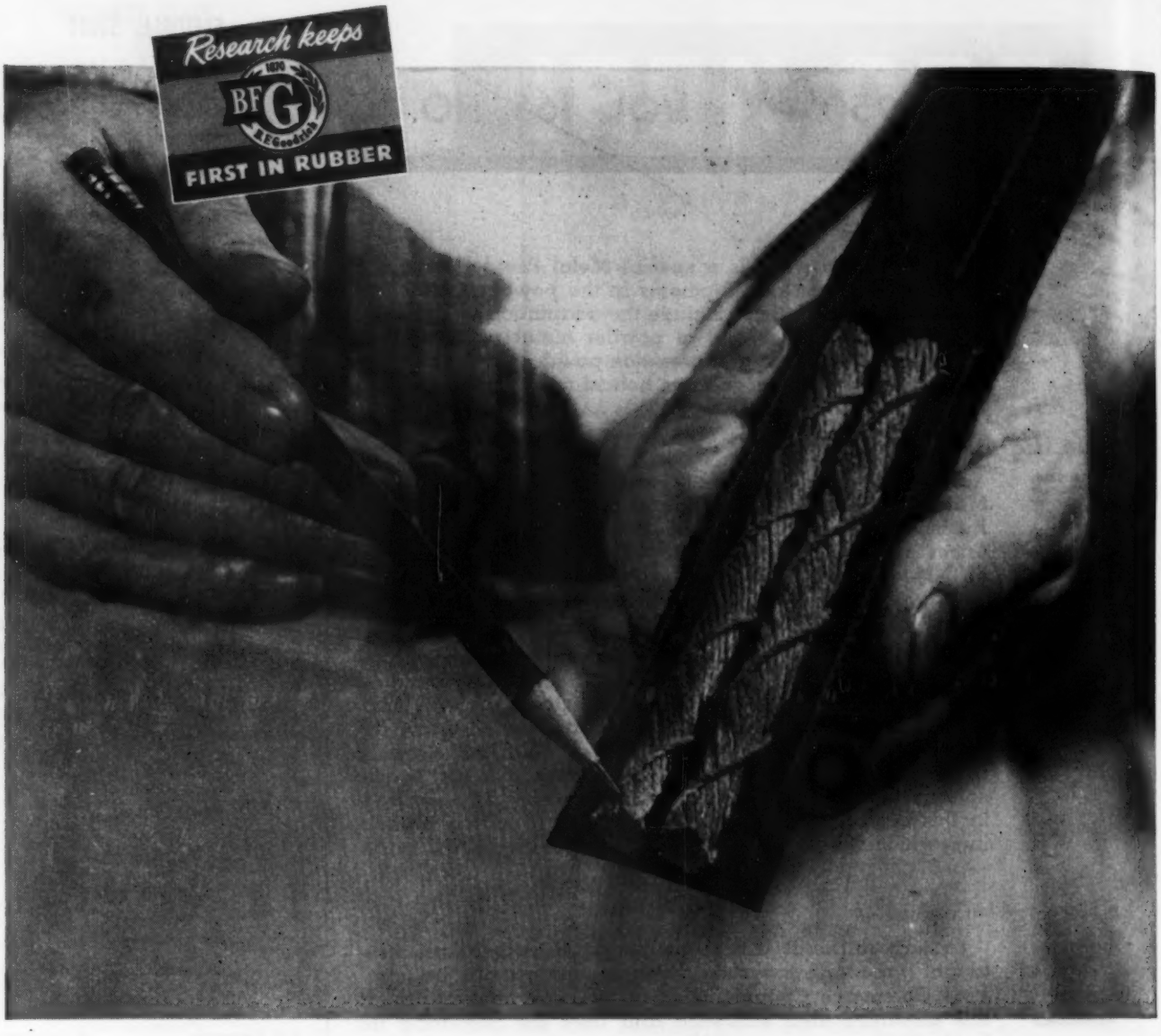


How twin grommets reduce belt failures

B. F. Goodrich grommet V belts last 20 to 50% longer

WHEN an ordinary V belt enters the sheave, the center cords are forced down and away from the center where the load is carried. Belt men call this "dishing" because the cord section becomes concave like a dish. With the new B. F. Goodrich V belt there are no center cords, no "dishing." Here's how it works —

All cords are put to work — Twin grommets are placed close to the driving faces of the belt. All the time the belt is in the pulley, the grommets keep working close to the driving surfaces. The load is evenly distributed. In laboratory tests, grommet V belts actually lasted 20 to 50% longer.

Every part is flexible — Because a grommet V belt has no stiff overlapping section, every part is equally flexible. Better grip, less slip. Grommet V belts give ⅓ more gripping power, pull heavier loads with a higher safety factor.

Endless grommets reduce belt failures — Most of the failures in ordinary belts occur where cords overlap. But in the B. F. Goodrich grommet V belt the cord section is *endless* — made by winding heavy cord on itself to form an endless loop. These are twin cord sections, *not ordinary cables.*

No other V belt has it — Twin grommet construction is found only in B. F. Goodrich V belts. (U. S. Patent No. 2,233,294.) It's a premium construction feature that costs you no more. At present made in D and E sections only. Ask your local B. F. Goodrich distributor to show you his "X-ray" belt that clearly illustrates grommet construction. *The B.F.Goodrich Company, Industrial and General Products Division, Akron, Ohio.*

Grommet V Belts BY

B.F.Goodrich

Editorial

INDUSTRY VIEWPOINTS

Termites at Work

THE average man never sees a termite at work.

Termites work in the dark. They travel along tunnels which, if broken, create chaos in the colony in the ground. But new tunnels are always made. The deaf and dumb workers are a dime a dozen.

The workers travel all day and all night. They eat away at wood when it is exposed to the ground. They take it to the colony where the higher orders are fed and taken care of. And then they start their journey back to the wood.

They are kept in line by policemen termites who are stationed at intervals in the tunnels and the wood. Their duty is to give a boot to the worker termite who gets out of line. All this time the outside of the wood never shows that termites are inside.

There is one thing termites need. They need water. To get that water they have to return to the colony in the ground with the food. There we find the queen who lays as many as 30,000 eggs a day. To make more termites. These queens have laid so many eggs in the past 18 years that most of the populous cities of the United States have termites.

Suppose something happens to the queen? They have extra termites who can be turned into queens so that there will be no interruption in the never ending job of eating at unprotected foundations. Proof of this is that each year wooden foundations are weakened, floors sag and, sometimes too late, the damage is discovered. It takes experts to get at termites.

There is another termite type which has wings. Sometimes they are called flying ants. But don't be fooled because you like ants. These flying termites are on their way to make a new and bigger colony.

Many people, mistaking them for flying ants, are not worried. But they should be. Because when those swirls of flying termites land they lose their wings. Then they start a new colony. The whole stream of workers begins again. The queen lays eggs. Unprotected foundations are attacked and everything goes forward until the termites are routed out.

But termites are not always routed out. You can't kill them all at once. There are too many. You have to isolate them. Break their tunnels. Expose them to poisonous chemicals. Preserve the wood. And then watch forever and a day so that they don't get going again at your foundation. Especially if it is cluttered up with unprotected wood touching the ground.

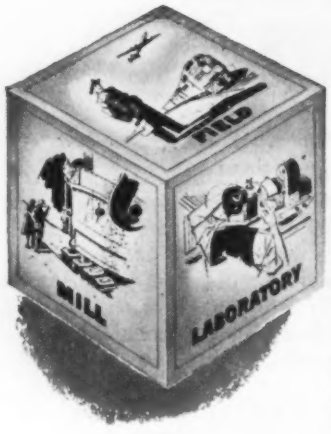
Which makes us think: The average man never sees a Communist at work either.

Tom C. Campbell

Editor

REPUBLIC Alloy Steels

Photo courtesy Sprout, Waldron & Co., Inc.



3-DIMENSION *Metallurgical Service*

. . . combines the extensive experience and coordinated abilities of Republic's *Field*, *Mill* and *Laboratory* Metallurgists with the knowledge and skills of your own engineers. It has helped guide users of Alloy Steels in countless industries to the correct steel and its most efficient usage. IT CAN DO THE SAME FOR YOU.

Other Republic Products include Carbon and Stainless Steels — Sheets, Strip, Plates, Pipe, Bars, Wire,

NEWSFRONT

NEWS, METHODS AND PRODUCT FORECAST

► Farm equipment sales are showing more than the usual seasonal upswing. One tractor builder has just stepped up production by 40 pct; another has added 50 units a day to its output; a third has reached the highest production rate in its history.

► A Midwest heating equipment manufacturer is now scheduling production on a new domestic oil burning furnace requiring stainless steel sheets.

► In the development stages for scale removal by induction heating is a rotating type hearth that carries billets through a tunnel-shaped inductor where a considerably wider variation in cross section is permitted. Variations in length can also be handled within the mechanical limitations of the equipment.

► Some makers of earthmoving equipment report sales are running at about double last year's figures.

► More stainless steel capacity is coming: Two companies will increase their facilities by July. One mill in Detroit expects to be producing ingots and strip in substantial tonnages by June. A Canadian company will complete its hot and cold mill installations fairly soon and will be rolling sheets up to 48-in. wide by mid-summer.

► The Air Materiel Command is developing a hollow 19-ft flash welded steel propeller suitable for quality production. It is also trying to improve production techniques for these blades.

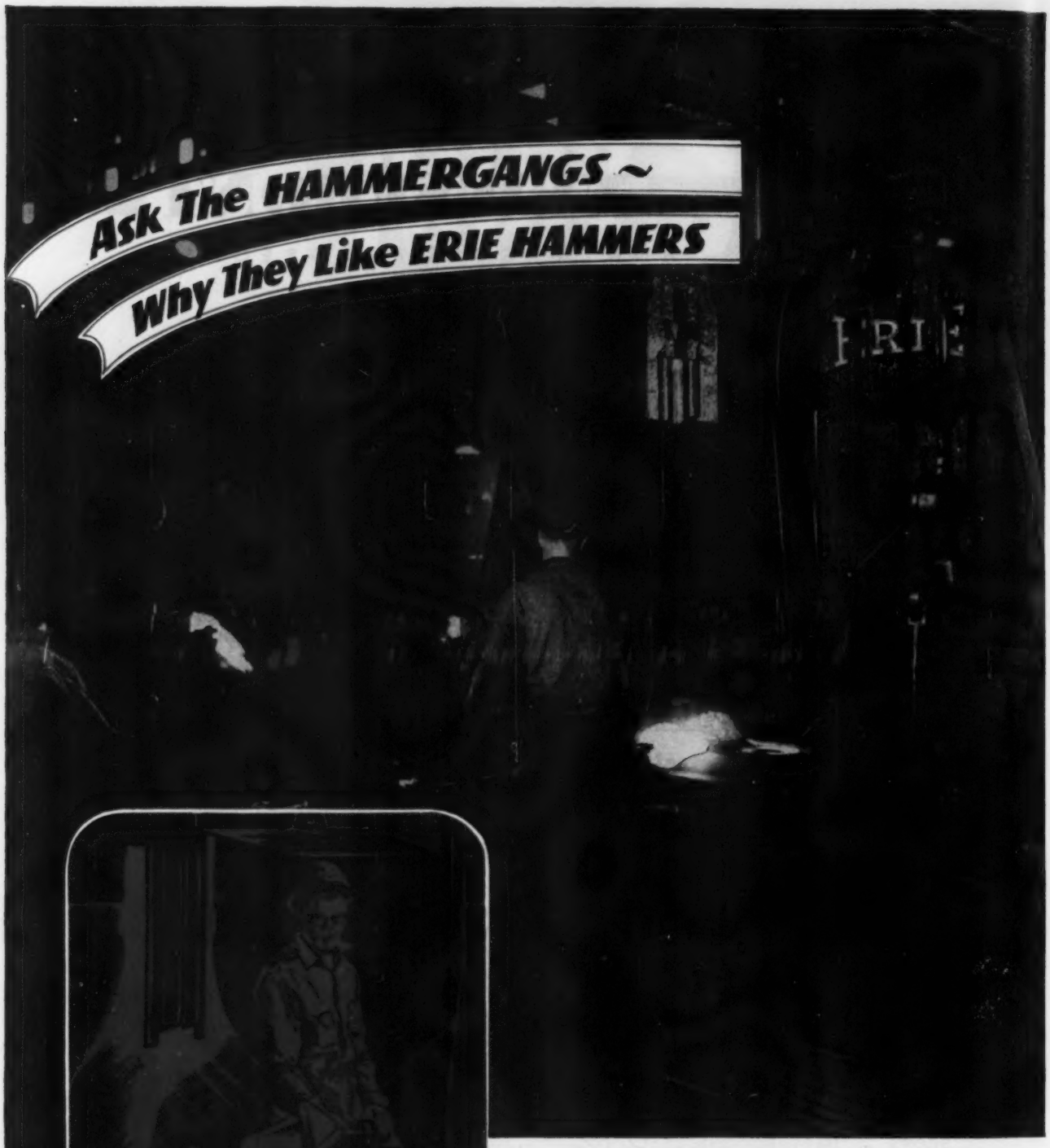
► McLouth Steel Corp. will shortly increase its ingot capacity by about 25 pct. Its electric furnaces will be changed over to top charging units in a move to boost scrap charging rates.

► The British-built Alfred Herbert turret lathe will be handled soon in this country by an Eastern machine tool firm. Also due on the U. S. market is a Swiss-type automatic. These machines will be shown in May, according to reports.

► A Birmingham foundry uses a neat arrangement on open-top cupolas with a system of fume control that works so well that a man can stand at the rim of the stack and breathe without choking--which is nice in these days of smoke control consciousness.

► A study soon to be published indicates that methods used in testing most metals are not suitable for stainless steel. By the suggested technique, stainless columns will take more load than conventional testing would indicate.

The report also recommends using a predetermined elastic modulus rather than an offset from a modulus line extended from the straight part of the stress-strain curve.



A GOOD hammer gang always works better with the rugged, dependable Erie Hammer on the team. On Erie Hammers all stressed parts, upper works, frames and anvils are steel.

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ERIE BUILDS *Dependable* HAMMERS

Scrap Reflects Good Times

Market Is Like A Balloon

Operations At Record Pace

The Iron Age SUMMARY

IRON AND STEEL INDUSTRY TRENDS

MORE price advances in the scrap market this week forecast a very bright outlook for the metalworking industry. An analysis of scrap prices and activity reveals the following salient features: (1) Steelmakers expect their operations to remain at a high level for several months. (2) Foundry business is picking up, and is expected to get better. (3) The sales outlook for autos, appliances and farm equipment is so bright that these industries are in conversion up to their ears. This conversion business is one of the strongest props supporting the scrap market.

All scrap markets are strong despite the careful and selective buying of the steel mills. This week THE IRON AGE steel scrap price composite again moved to new high ground for the year. And, reflecting the pickup in foundry activity, cast iron scrap is stronger than it has been for many months. Most brokers are paying more for scrap than the mills paid early this month. Active broker buying of this kind indicates speculation that prices will go still higher.

Hold 'Er—She's a Rearin'

Steel people are doing all they can to prevent a runaway scrap market. They are being "judicious" in their buying so as to disturb the demand-supply picture as little as possible. They are convinced that "crazy" buying created the "crazy" scrap market of 2 years ago, and they are trying not to repeat the process. This time they are nibbling at the market, trying to curb their appetites. Usually they will buy only when the scrap tonnage is on the ground.

But the scrap market is like a balloon. Once it is inflated, it can be held in at one point, but it will expand elsewhere. For example: The mills are using bigger hot metal charges to minimize their need for heavy melting grades of scrap. However, this has been reflected in a strengthening of short turnings which are used in the blast furnace. Although mills are buying heavy melting grades carefully, their use of electric furnaces in conversion steelmaking have given a shot in the arm to electric furnace grades of scrap.

This week the conversion market is stronger than it has been for many months. It is now certain to last longer than anyone would have predicted a few weeks ago—well into the third quarter. A common conversion arrangement is $40 a ton plus the cost of scrap. This is putting plenty of steam into the market for steel and scrap alike.

Steel Business Booming

Steel business is so good this week that some sales executives are warning their sales team against overconfidence. These veterans have learned that it pays to be realistic. They think that demand will continue strong through the third quarter—but they just want to make sure. Even the more cautious say that 1950 is going to be a good year for steel—a very good year.

They realize that part of the scramble for steel is due to production lost during the steel and coal strike and the desire of consumers to rebuild their inventories to satisfactory levels. They are keeping one eye on demand and the other on the ingot rate to see how soon supply will catch up with demand.

This week steelmaking operations are scheduled at 100 pct of rated capacity. If maintained, this rate will yield 1,906,300 tons of steel for the week. Since the industry's annual capacity is now almost 100 million tons, this means that production records are bound to fall if output stays at this level or higher.

Midwest Demand Tops

Demand for steel is strong in all areas. But it is still strongest in the Midwest—stemming from the Chicago and Detroit industrial areas. Their schedules are loaded. Some tonnage booked in the Midwest has been produced in Eastern mills and shipped back, involving higher freight costs to consumers. But the Eastern mills have enough orders of their own and are not anxious for any more of this business.

Baush offers Speed & Economy in Machining Automotive Cylinder Heads

This Baush 2-Way Heavy Duty Horizontal Hydraulic W-8 Type Multi-Spindle Drill has double-deck holding fixture to hold one (1) cylinder head in upper deck and one (1) head in lower deck while holes are being machined in both top and bottom faces. 90 spindles complete 3220 operations on 35 cylinder heads every hour at 100% efficiency.

UPPER STATION:

Drills — 12 Push Rod holes ½ way thru; 12 Valve Guide holes thru; 12 Stud holes ½ way thru

Counter bores — 3 Intake Valve seats; 3 Exhaust Valve seats

Core Drills — 2 outer clean-out holes

LOWER STATION:

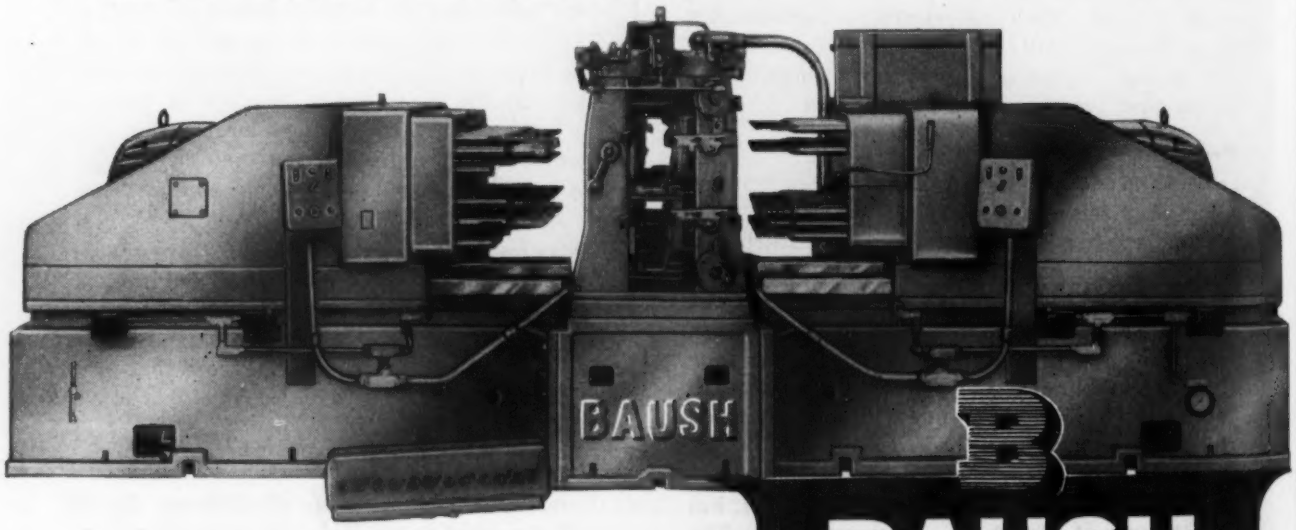
Drills — 12 Stud holes thru (to meet); 12 Push Rod holes thru (to meet)

Counter bores — 3 Intake Valve seats; 3 Exhaust Valve seats; 12 Valve Spring Washer seats

Core Drills — 2 center clean-out holes

Reams — 2 outer clean-out holes

MACHINE SPECIFICATIONS: W-8 Type horizontal end sections with hardened and ground steel ways . . . Individual hydraulic pumps & cylinders — 18" max. stroke . . . LH fixed center head — 40 spindles . . . RH fixed center head — 50 spindles . . . 2-40 HP spindle drive motors.



NOTE: An air operated elevator, not shown in this photo, is provided for upper and lower position loading of cylinder heads into fixture

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SPRINGFIELD 7, MASSACHUSETTS

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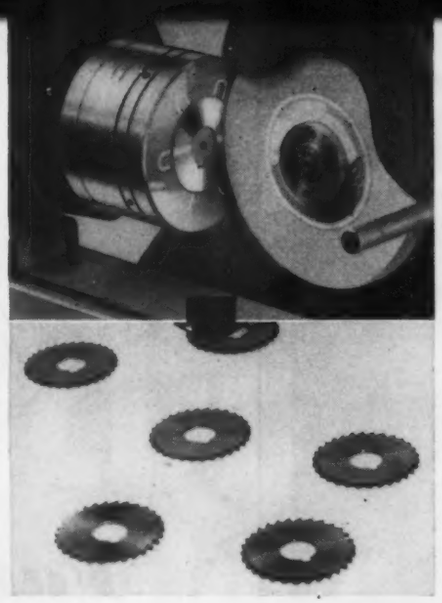
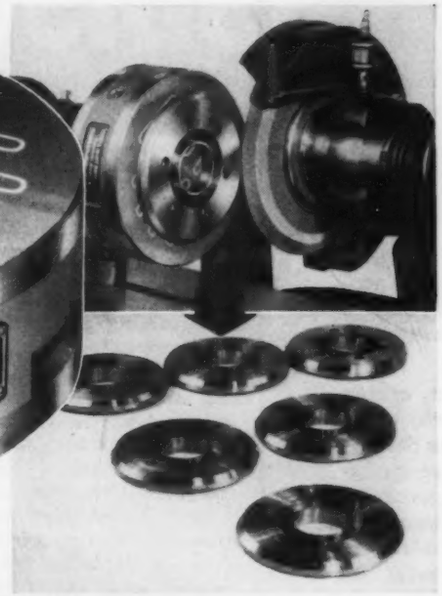
... in many of your grinding and light machining operations



FOR THIN WORK PIECES Rotary Model Permanent Magnet Chucks hold thin work pieces without distortion — permit machining down to thicknesses which would be impossible by any other means.

Model No. 9R has a diameter of 9¼ inches. Other stock models in 7 and 5 inches. Special sizes and shapes for particular applications.



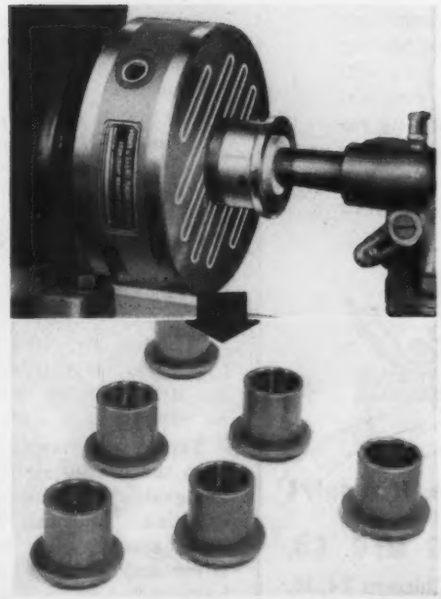
FOR CYLINDRICAL WORK Cylindrical grinding as well as face or disc grinding is done easily and quickly with Rotary Model Permanent Magnet Chucks . . . saving both time and cost.

ROTARY MODEL PERMANENT MAGNET CHUCKS

You can save time and money by using Brown & Sharpe Rotary Model Permanent Magnet Chucks in hundreds of holding applications. They cost nothing to operate . . . use no electricity . . . have no wires or electrical connections . . . do not heat under any conditions. And work may be held as long as desired. Convenient controls give positive holding . . . and instant release. No danger of work flying off due to a power interruption. Useful in either wet or dry grinding or machining.

For sale only in U.S.A. and its Territories. Write for detailed information on Rotary Model Permanent Magnet Chucks in 5", 7" and 9¼" diams., and Rectangular Models in 6 sizes from 2⁷⁄₁₆" x 5¼" to 12⅛" x 36". Brown & Sharpe Mfg. Co., Providence 1, R. I., U. S. A.

We urge buying through the Distributor



FOR INTERNAL GRINDING Simple machining operations on small parts often can be done faster and easier on Rotary Model Permanent Magnet Chucks. Work held or released with a quick 90° turn of a handle.

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skilled springmakers... AND practical, experienced engineers, SPECIALISTS in spring design and manufacture

IT takes people to make springs. Ours are specialized, highly trained, long-experienced people—well qualified to give you the finest in spring craftsmanship.

Our engineers too, are an important reason why you'll like Accurate Spring Service. They're old hands at springmaking... they've developed manufacturing systems and procedures that enable us to handle your jobs with the greatest speed and efficiency.

These Accurate engineers are at your service on spring design problems. You will benefit from their practical assistance in designing exactly the right spring for your application.

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Fatigue Cracks

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Canape Circuit

While Senator McCarthy is tangling with the State Dept. in the main arena, your favorite family journal's buoyant bureau chief, Gene Hardy, has an equally entertaining expose for the sideshow spectators.

Aside from the Congress, the big diversion on the Washington scene is parties—cocktail parties, buffets, luncheons, dinners, banquets, and teas. No excuse is needed. Although invitations are issued, a high percentage of those present are often adherents of the free lunch lobby who have advanced from the corner saloon to the nation's capital. Translated to the grand scale to which Washington has become accustomed, this means the food and liquor bill is cut considerably for expert spongers.

One lavish function at a swank Washington hotel found the freeloaders working their way down the buffet table, not missing a mushroom. The first man to reach the final silver dish was liberally anointing a cracker with a red, gelatinous substance, when a waiter tapped him on the arm.

"Pardon me, sir, but I don't think you want to eat that. We use it to heat the chafing dishes," he explained.

Yep, it was Sterno. "Most hotels keep the Sterno right in the cans alongside the chafing dishes," Gene explains. "But this one, being a little snooty, puts the stuff on silver dishes, ready to refuel the burners."

If you've wondered why Washington acts the way it does, here's a possible explanation. Not enough waiters to guard the Sterno.

Transformation

A propaganda piece on Britain's National Health Service explains that "Wigs are provided only if baldness arises as a result of an accident or a congenital or pathological condition, and if it is certified that a wig is clinically necessary to the patient."

Let's see. That takes in settlers scalped by unfriendly Indians, bald headed babies, and victims of falling hair who work in cold climates. Everybody else has to get along just by keeping his hat on. No security there.

Puzzlers

Here's how Martin Baron traces the reasoning by which "the wisest man in the land" knew he had a red spot on his forehead (Fatigue Cracks, Apr. 13):

"In order for all to stand, at least two of the wise men must have had red spots. If the spot on "A" were green, then "B" and "C" would have known that their spots were red. The fact that "B" and "C" did not immediately know the colors of their spots convinced "A" that his spot was also red. It is essential that "A" knows "B" and "C" are wise men."

That makes sense. But there's disagreement with the answer of 16¢ given by J. W. Foster to his problem ("What is the price of eggs per dozen when three eggs more for 20¢ would reduce the price 2 2/3¢ per dozen?"). Seems like the solution of 93 1/3¢ submitted by E. J. Sampson and H. Kelsea Moore fits better mathematically, as well as being more realistic. Our guess is that Reader Foster meant to say *raise* instead of *reduce* in stating the problem. But we're asking him.

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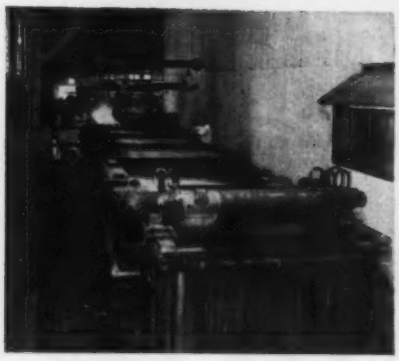

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Dear Editor

STAINLESS PRODUCTION

Sir:

Do you have or can you direct me to where I can get the geographic distribution of stainless steels by products for 1947, 1948 and/or 1949. I have the 1947 figures released by the Bureau of Census, but their total of 197,851 tons is so far from the 295,546 tons reported by AISI for the same year that I question the completeness of the Census survey.

J. D. HOWE
Staff Asst., Stainless
Carnegie-Illinois Steel Corp.
Chicago

We, too, have noted the disparity between the Bureau of Census figures and those of AISI. This could be caused by incomplete data or by differences of definitions. In our own market research, we have encountered many cases where differences of opinion exist over what is, or is not, alloy or stainless steel. That is chiefly the reason we have not published information on this subject.—Ed.

OIL RECLAMATION

Sir:

Your article appearing in the March 2nd issue entitled "Cutting Oil Reclamation Pays Off" was very interesting to me. As a matter of fact, it proved so interesting that I would like to inquire whether there are reprints available so that the information contained could be disbursed within our organization and also to some of our customers. I would appreciate receiving a few copies and would like your permission to reproduce the article in its entirety.

A. E. YATES
Industrial Service Engineer
Pure Oil Co.
Marketing Div.
Minneapolis, Minn.

Permission granted.—Ed.

TRANSLATOR

Sir:

Sometimes it is my job to do some translation of the articles published in THE IRON AGE, a periodical which I like very much, though I am no technician at all but just a girl who has some knowledge of the English language. You might, I suppose, not be too much surprised if I tell you that I should very much appreciate—from my little point of view—if your authors would prefer a style more easily to be understood by simple minds.

For example, there appeared in the issue of Dec. 29, the sentence:

"Bayle demonstrated that in every case there is an optimum value of arc current that produces maximum arc kw for that particular secondary voltage."

I should like it better if the sentence would read:

"Bayle demonstrated that in every case there is a maximum value of arc current that produces optimum arc kw for that particular secondary voltage."

Or am I wrong?—I should be pleased to hear your opinion about this.

HILDEGARD LUKAS
Osnabruck, Germany

If you will check further into the article mentioned, you will find that Mr. Bayle expressed himself correctly. He means that there is an *ideal* value of arc current to produce a maximum arc kw. What is desired is a maximum arc kw, not an ideal or optimum arc kw.—Ed.

EDITORIAL COMMENT

Sir:

I read the editorial in the Feb. 23 issue and agree with it in every respect. However I feel that your editorial needs a little qualifying. We need practical and successful businessmen in government and not those who have already lost their "shirts and neckties."

A. E. TREXLER

Sir:

Just finished reading your editorial in the March 23 issue and have sent this page to Senator Taft with remarks. Just a suggestion from an individual in the steel business for 28 years. Why not send out a bulletin to every steel producer and every warehouse and ask them to send your editorial to their congressmen and senators and also President Truman. Looks to me like the industry as a whole is not fighting hard enough.

H. F. STAMM

P.S. Why not a reprint so all individuals in each steel company can send one and flood Washington.

STEEL PLANT LOCATION

Sir:

Can you tell us where and how we can obtain a book which shows where the various steel items, such as structural shapes, plate, floor plate, bars, and bar size shapes, pipe, rails and sheets, are obtainable, and from which mills. We are not interested in jobber or warehouse stock.

P. J. McLEAN
Secretary-Treasurer
Union Steel Co.
Los Angeles

Probably the simplest ready reference as to the location and mills producing various steel items is the Steel Price Table which appears each week in THE IRON AGE. If you require more complete information, such as the size and capacity of each mill for the various products, you may wish to secure a copy of the "Directory of Iron & Steel Plants of the United States & Canada" published by the American Iron & Steel Institute, 350 Fifth Ave., New York 1, N. Y. The price is $10.00 per copy.—Ed.

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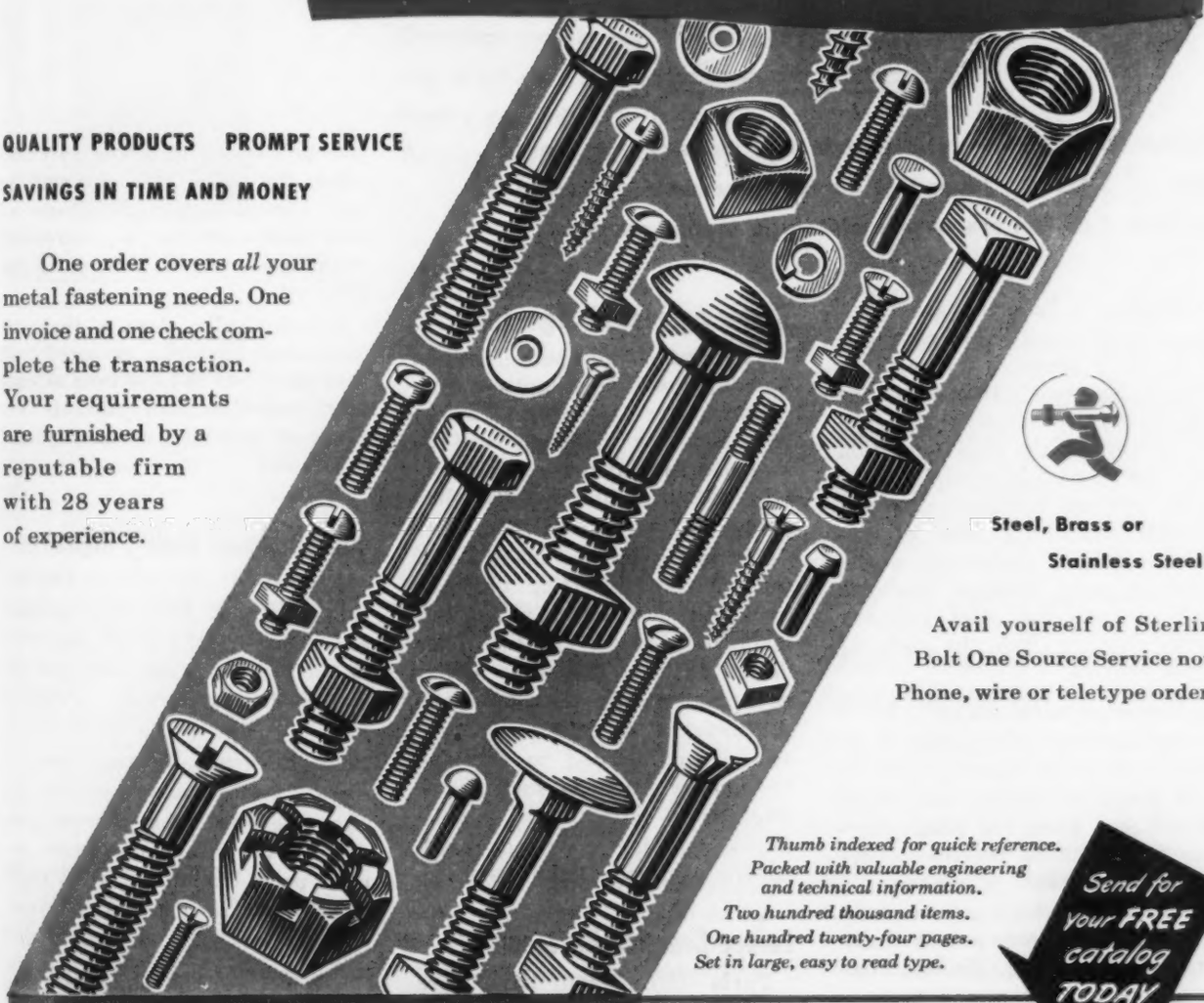

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GLOBAL LETTER

REVIEW OF WORLD MARKETS

British Laborites may still snatch steel industry into State fold . . . Siam and Japan sign barter agreement . . . Europe to have 3 million ton surplus of coal in second quarter.

London—A Laborite decree banning the introduction of new bills into the current parliamentary session has neatly trussed up the hands of Conservative Members in staving off the Fall formation of a Corporation to administer the Iron and Steel Nationalization Act already entered in the Statute Book. Only a Conservative victory at early General Elections can prevent the steel industry from slipping into the toils of State control.

Government Determined

Although the Act carries an effective date of Jan. 1, 1951, it will really be set into movement in October when the administering body will be formed—if the Labor government so wishes.

An ominous mood was set with the Prime Minister's words at the session's beginning. He said firmly that the government's purpose is to effectuate Acts passed.

The quality of coal production by nationalized mines was a barb twisting into the smarting hides of the Laborites recently at a fuel and power debate. Conservatives deplored coal quality as very poor. Prime Minister Attlee bantered about the criticisms of the debate and made it clear that his party will play the role of artful dodger to all major issues until it feels the time is propitious for voting.

Barter Agreement Signed

Thailand—Trade between Siam and Japan will be stimulated by a recent barter agreement. Siamese rice and raw materials will be swapped for Japanese steel, railway rolling equipment, electrical supplies, and textiles.

The agreement will make a dent in American exporting to Thailand but occupation authorities in Japan voiced no objection. They desire to ease Japanese dollar needs and reduce the burden on the taxpayer. American producers still expect demand to continue for quality products such as refrigerators, agricultural implements, building materials, automotive equipment, and others.

Europe Coal Surplus Looms

Paris—Europe will have more than 3 million tons of coal and coke on its hands in the second quarter of 1950 for which it cannot find buyers, reports the Economic Commission for Europe. Over a third of the extra tonnage will be steam coal, while almost 800,000 tons will be gas coal and more than 600,000 tons domestic coal.

The bulk of the surplus will be in France/Sarre—1.8 million tons. Belgium will have 1.1 million tons. Europe's coal plight was revealed after the ECE Coal Committee had allocated 4,854,500 tons of coal and coke to 13 European countries for April, May, and June delivery.

Paradoxically, despite the surplus, seven countries declared that they must buy 661,100 tons of coal from non-European markets because of problems of quality and payment.

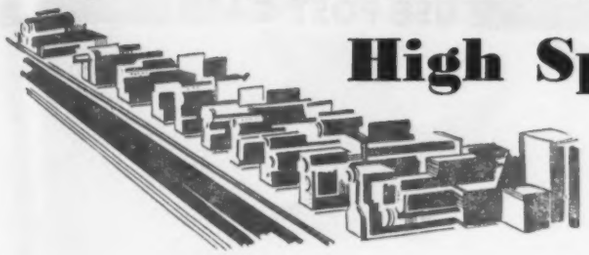
Europe Export Ability Improves

London—In the past six months, the ability of European producers to export the great majority of their engineering products has improved considerably. Preliminary reports of the United Nations Economic Commission for Europe state that new orders can either be filled from current production or within maximum periods up to 6 months. Much longer delays were the case last year. A few items such as boilers and turbines remain in short supply. Heavy machinery and equipment with specifications to order naturally have longer delivery dates.

U. S. Production Praised

Paris—The superiority of American over French production was credited to better working conditions, better plant layout, and less bureaucratic control at the French Foundry Convention, held recently in Charleville.

MACHINE TOOL High Spots



Sales Inquiries and Production

Overseas market lost to American producers . . . Europe's industry expands . . . U. S. loses Russian orbit trade.

by William A. Lloyd

Cleveland—A grim but factual picture of machine tool builders' future in foreign markets was painted this week by National Machine Tool Builders' Association, Cleveland.

NMTBA pointed out that the builder of standard, general purpose machine tools, the backbone of the U. S. industry, has already lost his overseas market and is losing his overseas dealers on whose ability depends his only hope of eventually recovering that market.

Competition to Increase

In a survey of foreign sales, based on information from machine tool builders and their dealers overseas, NMTBA warned that "even after the problem of dollar credits is solved, as it may be by international loans, the question of foreign competition remains and will undoubtedly increase."

The German machine tool industry which supplied many of the foreign countries before the war is being rebuilt. Starting is a powerful movement to create or enlarge the machine tool industry in more than 14 foreign countries, including Canada, Australia, France, Italy and Switzerland.

"The shortage of dollars has played into their hands. Every effort is made to foster domestic sources, or failing that, to divert orders to each other, even when the better delivery of the U. S. machine and its advantages of greater productivity and accuracy are unquestioned," the survey charged.

"The policy of ECA in urging more trade between these nations contributes to the results."

The sudden application of a complete embargo on shipments of U. S. machine tools to the Russian orbit in 1948 and the eagerness of England and European nations for this business has diverted a very large amount of trade to them. The U. S. machine tool industry thus lost its largest single overseas customers without impairing the Russian war potential in the slightest, continued the survey.

British Aid Producers

Effectiveness of foreign government cooperation is best exemplified by the policies of the United Kingdom, which not only encourages trade with Russia, but prohibits importation of U. S. machines of a type or kind made in England. Also, the British machine tool builder has "Empire preference" in the British Commonwealth.

The survey reveals that the cost of displaying British machines at the Canadian International Trade Fair in Toronto, in June, will be partly defrayed by the British Treasury.

Also, for a small fee, the British machine tool builder is given insurance against exchange or credit losses in his foreign market, thus permitting him to offer more favorable terms of payment.

Abnormal Growth

Finally, the British Treasury permits a much faster recovery of capital invested in a machine tool than does the U. S. Treasury.

"The one bright spot is the allocation of ECA funds for U. S. machine tools, but these are sufficient only for special machines or machines of a type not procurable elsewhere," noted the survey.

"Present policies of the U. S. government will lead to the development of machine tool industries in many overseas countries which are "all out of proportion to the normal needs of those countries," the report concludes.

Romos Enterprises Acquires Sidney Machine Tool Co. Control

In Sidney, Ohio, controlling interest in Sidney Machine Tool Co. was acquired recently by a Cincinnati group headed by the Moscowitz Brothers and Sidney G. Rose, operating as Romos Enterprises.

New officers of Sidney Machine Tool Co. are Sidney G. Rose, president; Philip L. Moscowitz, vice-president; Ben Moscowitz, vice-president; Frank J. Fields, vice-president and general manager; Joseph H. Hoodin, treasurer; Fred Weiland, secretary and F. D. Dickas, assistant secretary and assistant treasurer.

Mr. Fields was vice-president and general manager under the former management and Mr. Dickas was formerly secretary of the firm. No further personnel changes are contemplated.

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PUBLICATIONS

New publications that describe money saving equipment and services are available free and without obligation. Copies can be obtained by filling in the attached card and mailing it.

Steel Spoke Wheels

Geneva challenger steel spoke wheels, with disc hub construction, are featured in an 8-p. catalog listing various types and specifications. *Geneva Metal Wheel Co. For more information, check No.* 1 *on the postcard.*

Ventilating Louvers

Swartwout adjustable and fixed Airlouver systems, providing adaptability to any requirement in commercial, industrial or institutional structures, are described in a 4-p. illustrated folder. *Swartwout Co. For more information, check No.* 2 *on the postcard.*

Construction Materials

A description of Atlas chemical construction materials, along with estimating data for Atlas products, are presented in an 8-p. folder on corrosion-proof materials. *Atlas Mineral Products Co. For more information, check No.* 3 *on the postcard.*

Crush Grinding

The Jerpbak-Bayless low cost, portable compact, motorized wheel crusher unit for forming grinding wheels with intricate or multiple forms is described on a new 2-p. data sheet. *Jerpbak-Bayless Co. For more information, check No.* 4 *on the postcard.*

Shielded Arc Welding

A new 6-p. folder, entitled "Inert Gas-Shielded Arc Welding Equipment," describes the main features and specifications of Heliarc apparatus now available. *Linde Air Products Co. For more information, check No.* 5 *on the postcard.*

Cushioned Couplings

Falk Airflex Couplings for frequent high torque load fluctuations associated with internal combustion engines, reciprocating pumps and similar devices, are described in a new 8-p. bulletin. *Falk Co. For more information, check No.* 6 *on the postcard.*

Inside Micrometers

Selected dimensions of standard models of Rimat inside micrometers for measuring snap ring grooves, O-ring grooves, and large, deep or small bores, are shown in a new 4-p. bulletin. *Rimat Machine Tool Co. For more information, check No.* 7 *on the postcard.*

Hand Trucks

The new Feather-Lite Wheel-Ezy hand truck and new floor trucks, and Roustabout platform trucks, are described in a series of folders and bulletins. *Rapids-Standard Co., Inc. For more information, check No.* 8 *on the postcard.*

Diamond Turner

How the new Citco Hydraulic Diamond Turner aids in cutting diamond and grinding costs, and can step up production rates and efficiency, is demonstrated graphically in a new brochure. *Cleveland Industrial Tool Corp. For more information, check No.* 9 *on the postcard.*

Powdered Metal

Primary advantages and new possibilities for the use of powdered metal are listed in an 8-p. catalog showing average physical properties of PMP Powdermet parts. *Powdered Metal Products Corp. of America. For more information, check No.* 10 *on the postcard.*

Building Panels

Fenestra steel and aluminum building panels, for use in floors, walls, roofs and partitions, are described in a new 38-p. catalog showing a number of applications and cross-sectional drawings of panels. *Detroit Steel Products Co. For more information, check No.* 11 *on the postcard.*

Reinforcing Bars

A new 8-p. bulletin describing a specialized steel service for contractors features Hi-Bond reinforcing bars, a uniquely designed bar that is said to give greater bond between steel and concrete. Other featured products for the contractor

Turn to Page 157

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NEW

PRODUCTION IDEAS

New and improved production ideas, equipment, services and methods described here offer production economies. For price and other information, fill in the attached card and mail it.

Hydraulic Cylinders

A new line of Gerotor hydraulic cylinders has a piston rod twice the diameter to that of standard rod size. Known as the 2:1 cylinder, the new Gerotor design can be adapted to a variety of hydraulic circuits, to accomplish more work and save time and costs. Cylinders with twice-size rods are also recommended to support larger loads where straight linear motion is used. The cylinders are available in 6 mountings, in ten bore diameters; in any length stroke up to 96 in. and with cushioning either or both ends of the piston rods. *Rivett Lathe & Grinder, Inc. For more information, check No.* 18 *on the postcard.*

Metal Stamping Fixture

For marking metal name plates in mass production operations, a special stamping fixture has been designed for use in a small power press, screw press or kick press. The device is composed of a chase block that contains the steel marking letters and a striking block that is held in the throat of the press by set screws. Slots for containing the letters are machined out of the solid tool steel chase block to suit the setup of the name plate layout. Logotypes are supplied when the same style plate is used for several different models. *M. E. Cunningham Co. For more information, check No.* 19 *on the postcard.*

Steam-Spray Painting Unit

The Speedyelectric SP500, an all-electric steam power plant designed for use in steam-spray finishing, is complete with built-in 100 psi boiler, ASME Code, National Board inspected and stamped, Underwriters' Laboratories listed. It includes an electric superheater with thermostatic control and boiler feed pump, motor and controls. The boiler is self-regulating, maintaining electric input in exact balance

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PRODUCTION IDEAS

Continued

with steam output. Capacities range from 1 to 10 spray-guns or larger. *Livingstone Engineering Co. For more information, check No. 20 on the postcard.*

Flow Rate Indicators

Improved flow rate indicators for air and gas provide data about gas-air mixture ratios for precise combustion requirements. Known as Flo - Scopes, the measuring devices are used where controlled protective atmospheres are required for the prevention of high temperature deterioration of material during heat treatment. Also, they measure components entering special atmosphere generators, and the cool protective gases delivered from generators or from storage cylinders. In the chemical industry, they maintain proportions of gaseous ingredients entering synthesis and measure the flow of protective gases that prevent fires or slow oxidation of materials. *Selas Corp. of America. For more information, check No. 21 on the postcard.*

Bearing Lubricant Tester

A compact, semi-portable device for low-temperature testing of ball-bearing lubricants has a cooling chamber that resembles a large bucket with a smaller bucket inside, both covered by a transparent plastic lid. Dry ice is placed in the space between the inner and outer buckets. In testing, a ball bearing is placed on a spindle in the inner bucket and rotated by a small electric motor. The tendency of the outer ring of the ball bearing to move with the inner ring is measured by a strain gage. If the lubricant thickens in the cold atmosphere, the inner ring will not turn freely, and the gage registers a greater strain on the outer ring. *General Electric Co. For more information, check No. 22 on the postcard.*

Transformer Pads

A cladmetal of copper permanently bonded to steel is available for ground pads applied to electric power transformers. Its advantages include ease of handling and manufacturing where the transformer is required to comply with NEMA specifications in sizes of 167 KVA or larger. Only a simple arc weld is needed to apply the pad to the transformer case. The cladmetal pads can be cut to sizes and stocked for future use. *American Cladmetal Co. For more information, check No. 23 on the postcard.*

Zircon Product

Zirkatom, an intermediate sized product having high purity and uniformity, permits close shrinkage control in refractory bodies and zircon porcelain, faster solution in enamel frits and glasses, and finer grained foundry facings. Particle size is intermediate between standard milled zircon and extremely finely ground, premium priced special opacifier grades. It is ground to a trace on 325 mesh with an average 50 pct passing 10 microns. *Foote Mineral Co. For more information, check No. 24 on the postcard.*

Contour Projector

A new contour projector provides a full 14¾-in. work space between the lamphouse and lens, regardless of magnification. The work table has been enlarged to 20 in. long and vertical travel has been increased from 2 to 4 in. Eight inches of space is provided between the object under inspection and the first lens of the projection system. Additional work space has been gained by relocating the lamphouse. Surface projection with the new instrument is made easier by a mirror attachment which provides surface or blind hole illumination in any of five planes. A ball-bear-

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JOB FACTS

Operation — Remove 3/8" stock, 1 3/4" wide on brake band 7" dia.

Cutters — B-C Tantung-Tipped Slab Mills, 4 1/2" x 4" x 1 1/2"

Material — SAE 5140 Steel

Cutter Speed — 175 RPM

Tool Life — 250 pieces per sharp. 15-20 sharpenings

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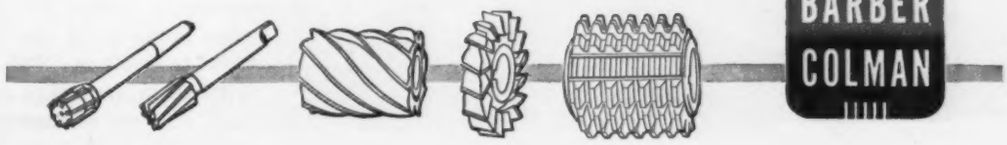

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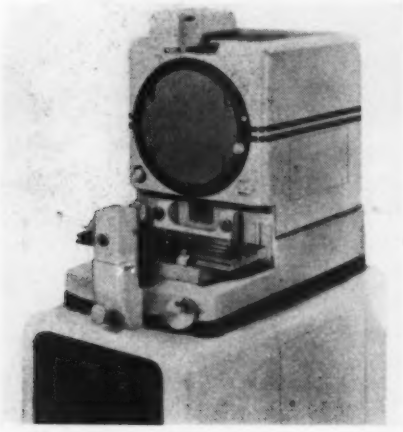
NEW PRODUCTION IDEAS

Continued

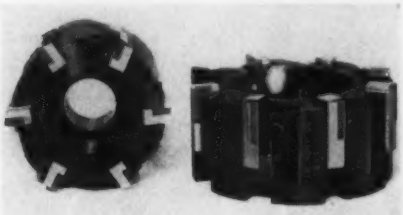
ing mounted, six-station lens turret permits instant selection of any of six magnifications by turning a



handwheel. Lenses available for the turret are made in 10X, 20X, 31.25X, 50X, 62.5X and 100X magnifications. They are corrected to produce a distortion-free image giving exact magnification over the entire 14-in. screen. *Eastman Kodak Co. For more information, check No. 25 on the postcard on p. 37.*

Shell End Mill

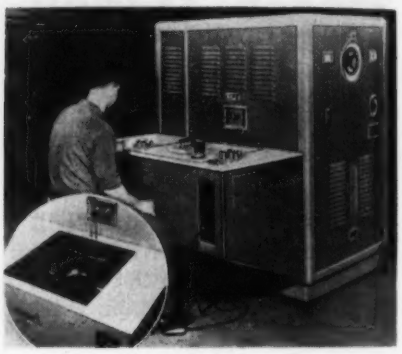
A new carbide tipped inserted blade shell end mill has been designed for milling of cast iron, brass, etc. The carbide tipped replaceable serrated back blades are firmly held, easily adjusted, and



their sturdy construction is said to insure maximum rigidity at high table feeds, and long and trouble-free production life. The cutter is offered to standard specifications in 3, 4, 5, and 6-in. diam, in right hand only, the number of blades in each case being twice the diameter. *Super Tool Co. For more information, check No. 27 on the postcard on p. 37.*

Quench Tank

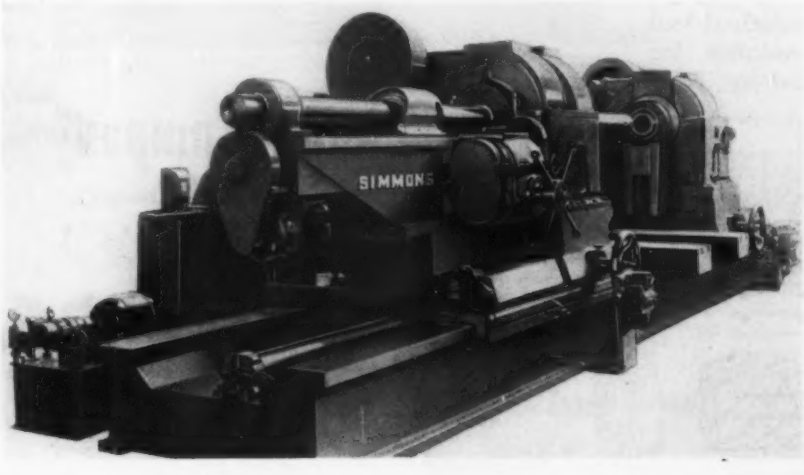
A new combination work table and quench tank can be attached to Lepel high frequency converters. The unit forms a hand work table 29 x 56 in. for mounting work coils and fixtures. The center portion of the table-top may be removed, uncovering a brass or stainless steel quench tank 24 x 24 x 18 in. deep, fed by a 1-in. water line, solenoid controlled. Water, oil or brine quenching is possible in the sink. It will also accommodate the Lepel rotor heating and quenching unit, designed for the hardening of



gears, blanks, etc. Heating and quenching cycles are controlled by a three circuit timer operated by pushbutton or footswitch. *Lepel High Frequency Laboratories, Inc. For more information, check No. 28 on the postcard on p. 37.*

Boring-Facing Machine

Designed to bore large holes with long depths accurately, a new 6-in. bar horizontal boring and facing machine performs all types of cylindrical work. In addition to the bar feed in the head, the entire boring and facing unit moves hydraulically along the bed. The machine uses carbide tooling and delivers a range of bar speeds between 3 and 150 rpm and bar feeds from 0.0005 to 0.500 ipr. It has a 40 hp motor drive with precision antifriction bearings and alloy steel gearing throughout. Standard length of the bar is 17 ft and the travel in one setting is 60 in. Bed lengths and widths can be supplied to meet requirements. *Simmons Machine Tool Corp. For more information, check No. 26 on the postcard on p. 37.*



Arc Welder

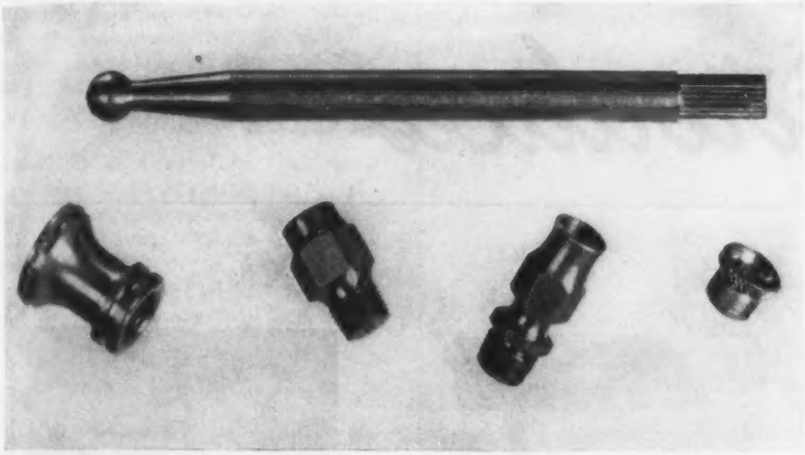
Instant amperage changes without leaving the work and without breaking the arc are possible on the new ac arc welder for Heliarc welding. Controlled at the work by a reversible foot switch, the amperage can be changed from minimum to maximum or vice versa, within a few seconds. This control is said to eliminate craters and facilitate amperage change by the operator when going from one thickness of metal to another. The welders are supplied in amperage ranges of 10

Turn to Page 158

COPPER ALLOY BULLETIN

REPORTING NEWS AND TECHNICAL DEVELOPMENTS OF COPPER AND COPPER-BASE ALLOYS

Prepared Each Month by BRIDGEPORT BRASS COMPANY "Bridgeport" Headquarters for BRASS, BRONZE and COPPER



Screw machine items illustrating knurling and roll threading operations. Courtesy, Seymour Brass Turnings Company.

Free Machining Brass Rod Suitable For Roll Threading

Roll threading and knurling in the primary screw machine operation have done much to reduce the cost on thousands of precision and ornamental parts.

To keep pace with this trend, it has been necessary for the brass fabricator to carefully control temper to give free machining rod sufficient ductility to permit cold deformation of this type and at the same time maintain the highest machinability rating.

Bridgeport's Ledrite 6, free turning brass rod, was used for the parts shown in the accompanying photograph. These parts were made by Seymour Brass Turnings Company, Seymour, Conn., and are good examples of straight, diamond and bead knurling as well as thread rolling.

Stop Supports Long Piece

The long part at the top is an automobile mirror swivel arm. It is five inches long and 3/8" in diameter. The stock is fed out in a #2 Brown & Sharpe about 1", box turned, straight knurled and drilled from the turret. It is fed out again to a turret stop which takes the knurled diameter and rests against the turned shoulder to give support for the ball forming operation and cutoff. The work is turned at around 350 feet per minute and the feed is 0.0015" per revolution.

The two air-vent valves for heating systems are made from hex rod. Besides deep drilling and multiple forming, the threads are rolled in the screw machine and are 3/8" pipe. No difficulty is encountered in using the free machining Ledrite 6 Brass rod. The cord bushing has a diamond knurl and the threads are rolled. The knurl on the lamp finial has a ball knurl which is produced by actual deformation under pressure of the knurling tool. A narrow ridge is turned by the forming tool on the large end for knurling. The material shows no signs of cracking or splitting.

Temper Controlled

In sizes from 3/8" up, the temper of this rod stock is kept low enough to permit knurling and maintain free machining of its properties. If there is no knurling or roll threading involved, Bridgeport can supply rod in a higher temper. Screw machine fabricators, however, report little or no difference in the machining characteristics of the two rods despite the difference in temper.

In rod sizes below 3/8", Bridgeport rod is slightly harder in temper to insure against bending and buckling during machining. When using sizes below 3/8" if any difficulty is encountered in roll threading or knurling, it may be necessary to change to a softer temper or switch to another alloy which is more ductile such as Ledrite 2, which contains slightly less lead with the copper increased correspondingly. This alloy is also useful where exceptionally accurate knurls and rolled threads are demanded as in the precision instrument field. But for the majority of cases the standard free cutting brass rod is very satisfactory.

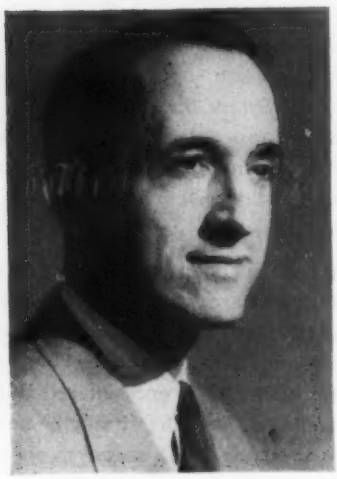
When selecting alloys, especially where intricate forming, roll threading or knurling is involved, Bridgeport's Laboratory should be consulted. Also make use of its valuable experience to help you solve other metal problems such as improving products or reducing costs.

BRASS · BRONZE · COPPER · DURONZE — STRIP · ROD · WIRE · TUBING

MILLS IN
BRIDGEPORT, CONNECTICUT
INDIANAPOLIS, INDIANA
In Canada:
Noranda Copper and Brass Limited, Montreal

BRIDGEPORT BRASS COMPANY
BRIDGEPORT 2, CONNECTICUT
Established 1865
"Bridgeport" *District Offices and Warehouses in Principal Cities*

Iron Age *Introduces*



RICHARD A. BIGGS, director of architectural development, Crucible Steel Co. of America.

H. S. CARLSEN, assistant to the vice-president, Gould Storage Battery Corp.

ADOLPH S. PEZOLDT, JR., purchasing agent, Morrison Steel Products, Inc.

Richard A. Biggs was appointed director of architectural development for the CRUCIBLE STEEL CO. OF AMERICA. Formerly development engineer of PITTSBURGH CORNING CORP., Pittsburgh, Mr. Biggs makes New York the headquarters of his countrywide Crucible activities.

Albert E. Zeisel, former vice-president and general sales manager, EUTECTIC WELDING ALLOYS CORP., New York, has resigned his post.

William N. Brown has been appointed purchasing agent of the PITTSURGH STEAMSHIP CO., a U. S. STEEL subsidiary. He will be located at Pittsburgh Steamship's general office in Cleveland.

H. S. Carlsen, assistant to the vice-president, GOULD STORAGE BATTERY CORP., has been assigned to the coordination of railroad sales activities. Mr. Carlsen's headquarters will be in Trenton, N. J., where the sales headquarters of Gould are located. **F. A. Miller** was named northeast regional manager for the company and **Mal Janis** was advanced to the post of New York district manager, the position formerly held by Mr. Miller.

A. G. Delany, former superintendent of maintenance for the southern district, REPUBLIC STEEL CORP., has been appointed assistant manager for the district. **E. L. Brown**, general superintendent of Republic's steel plant at Gadsden, Ala., has resigned.

Adolph S. Pezoldt, Jr. has been appointed purchasing agent of MORRISON STEEL PRODUCTS, INC., Buffalo. He will work under the supervision of **M. Jacque Kohnstamm**, vice-president and director of purchases, who assumes the new duties of assistant to the president.

H. A. Brassert will continue as chairman of the board of directors of H. A. BRASSERT & CO., New York. **C. A. Brassert** becomes president and **B. L. Jones** serves as vice-president.

H. L. Edgcomb president of the EDGCOMB STEEL CORP. since the foundation of the company in 1927, has been elected to the office of chairman of the board. **George L. Tillson** was elected president and treasurer.

Paul H. Dunakin was elected executive vice-president of the HYDRO-BLAST CORP., Chicago. The company also announced the appointment of **Ronald Webster** as sales manager. Mr. Webster was vice-president and general manager until 1941, when ill health required him to serve as a consultant only.

George E. Frost was named manager of the newly-created products service div. of WINCHESTER REPEATING ARMS CO., division of OLIN INDUSTRIES, INC.

Herbert E. Cragin, Jr., has been promoted to assistant to the president in charge of engineering research and development for the TAYLOR-WHARTON IRON & STEEL CO. **Erwin H. Mebs** will succeed Mr. Cragin as plant manager of the High Ridge, N. J., foundry.

John W. Myers, vice-president, has been elected a member of the board of directors of NORTHROP AIRCRAFT INC., Hawthorne, Calif., to succeed C. N. **Monson** who resigned. **Kenneth P. Bowen** has been named vice-president in charge of manufacturing to replace **B. G. Reed,** resigned. **Roland J. Pagen** has been elected vice-president and director of finance and accounts and will also continue as treasurer and **George T. Johnson** assumes Mr. Pagen's duties as controller.

James A. Cowan was transferred to Pittsburgh as direct factory representative for MACWHYTE CO., Kenosha, Wis. Mr. Cowan has been with the company for 13 years in various sales capacities. His territory will be in Pennsylvania and New York.

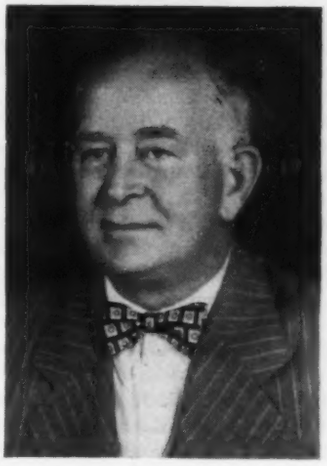
John M. Hooper becomes staff engineer in the engineering dept. of COLUMBIA STEEL CO., with headquarters in Oakland, Calif. Mr. Hooper had previously been assistant general superintendent at the Fontana steel plant of the KAISER STEEL CORP.

Paul H. Daley has been named general superintendent of the HEPPENSTALL CO. steel forgings plant in Pittsburgh. He assumes the former responsibilities of **Harry W. Davidson,** recently elected secretary-treasurer of the company.

Milton K. Grey has joined the BENCHMASTER MFG. CO., Los Angeles, as director of sales and advertising. He is a former vice-president of the HILL-SHAW CO., Chicago.

Iron Age Salutes

HENRY A. ROEMER



SOME men rise to industrial heights purely on administrative ability—on knowing how to run things the right way. Others rise to personal heights because of their innate understanding of human engineering. A few get to the top of the heap because they combine both these qualities. The topnotch administrator who has the respect, admiration—even the love—of his workers and associates is a rare man.

When the Youngstown Chamber of Commerce recently put on a big banquet as a tribute to Henry Roemer, they were only making official what his many friends and employees have known for years. Here is a man who has made no compromise with what is right and with what is fair. That has been his creed since he started in the steel business at the age of 15.

But more important, and the main reason why THE IRON AGE salutes Mr. Roemer, is his outstanding modesty in a field where over the years he has been almost a father to many of those who are now in high places.

Henry Roemer has never turned down any request for his time, his money or his friendship when the request was an honest and forthright one. Because of this trait he has been so busy in recent years he has had little time to twiddle his thumbs.

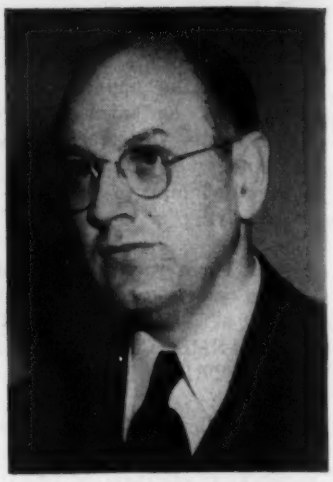
He is one of those rare men who remembers and understands the heartbreaks of the youngsters as they meet with and try to become a part of management. For them he has had understanding and grace. For them he has had advice that could be used. And for them he has agreed to be their father confessor and their checker-upper.

Few business leaders have a wider background than Henry Roemer. He organized and built Superior Sheet Steel Co., and founded Continental Steel Corp. and Niles Rolling Mill Co. He has been chairman and president of Pittsburgh Steel Co., and board chairman of Mullins Mfg. Co. He joined Sharon in 1930 and is now chairman and president of Sharon Steel Corp.

Though he had to cut short his formal education to go to work at 14, Henry Roemer has long been a friend of education. He has been a trustee of Bucknell University and of Youngstown College and is a director of Pennsylvania Junior Republic, a boy's school. He holds the degree of Doctor of Humanities from Westminster College.

ROBERT S. CAVE, general sales manager, Severance Tool Industries, Inc.

CARL M. RIEFKIN, general manager of the rolling mill div., Newport Steel Corp.



WALTER T. NICHOLSON, assistant to rolling div. superintendent, Carnegie-Illinois Steel Corp.

Robert S. Cave becomes general sales manager of SEVERANCE TOOL INDUSTRIES, INC., Saginaw, Mich. Mr. Cave started with Severance in 1940 as a machine operator and has served in various positions with the company since that time. He was recently assistant sales manager.

Randolph E. Wolcott has been named purchasing agent for NATIONAL MOTOR BEARING CO., INC., with headquarters at Redwood City, Calif., to succeed **Worth Johnson.**

O. O. Lewis and **F. J. Heaslip** have been elected vice-presidents of FAIRBANKS, MORSE & CO., Chicago. They will serve as vice-president in charge of sales and vice-president in charge of purchases and traffic, respectively. Both men have been associated with the company for many years, Mr. Lewis since 1908, and Mr. Heaslip since 1927.

Carl M. Riefkin was appointed general manager of the rolling mill div., Newport, Ky., for the NEWPORT STEEL CORP. Mr. Riefkin has been associated with steel operations at Newport for 26 years. Prior to this appointment he was general manager of sales.

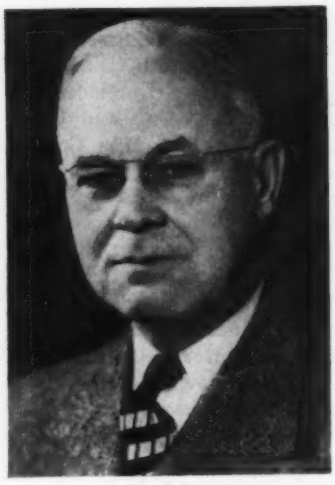
Louis F. Weyand, vice-president in charge of MINNESOTA MINING & MFG. CO.'S adhesives and coatings div., was elected to the firm's board of directors.

Harley J. Bennett has retired from his position as manager of claims for the sales dept. of COLUMBIA STEEL CO. after 39 years of service.

Frederick E. Wood has been named to the position of steel buyer, and **Lester Bufton** has been promoted to buyer of supplies and resale items for INLAND STEEL PRODUCTS CO., Milwaukee.

Walter T. Nicholson, superintendent of the wide flange structural department, South Chicago Works of CARNEGIE - ILLINOIS STEEL CORP., has been appointed assistant to rolling division superintendent. **Patterson S. Weaver,** formerly assistant to general superintendent, has succeeded Mr. Nicholson, while **John R. Ferguson, Jr.,** works assistant chief engineer, takes over Mr. Weaver's former post. **Harry S. Spitz,** who has succeeded Mr. Ferguson, has been transferred to Chicago from the corporation's Pittsburgh operations where he held a similar post at Clairton Works.

E. T. Peterson was named vice-president of engineering for the BIRDSBORO STEEL FOUNDRY & MACHINE CO., Birdsboro, Pa. Mr. Peterson has been associated with the company for 27 years, recently as chief engineer in the rolling mill dept.



F. J. HEASLIP, vice-president in charge of purchases and traffic, Fairbanks, Morse & Co.

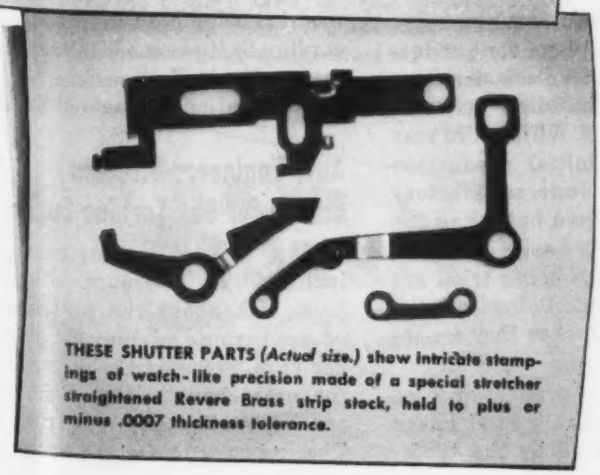
O. O. LEWIS, vice-president in charge of sales, Fairbanks, Morse & Co.

E. T. PETERSON, vice-president of engineering, Birdsboro Steel Foundry & Machine Co.

ARGOFLEX 75 CAMERA—Most popular in the Argus line.

LIFE TEST MACHINE—Automatically winds and snaps shutter. Constant tests made show shutter will click for a lifetime of picture-taking by the most ardent camera fan.

ARGOFLEX 75—With case removed to show complete shutter assembly.



THESE SHUTTER PARTS (*Actual size.*) show intricate stampings of watch-like precision made of a special stretcher straightened Revere Brass strip stock, held to plus or minus .0007 thickness tolerance.

WHY THE ARGOFLEX 75 GIVES CAMERA FANS

A Lifetime of Clicks without Kicks

Revere Brass used in shutter mechanism combines special tolerances and watch-like precision with durability and low cost

IN developing the shutter mechanism for their Argoflex 75 camera, engineers of Argus, Inc., Ann Arbor, Mich., had to cope with an unusually tough combination of problems. Production called for progressive die stamping operations, while to further complicate matters the stamped parts had to be constructed so as to incorporate the added feature of making double exposures impossible. The stock used had to be in strip form and without camber.

At the same time tolerances of 1/1000 to 2/1000 of an inch had to be maintained throughout the entire length of the strip, because the shutter parts had to function with watch-like precision. All of these requirements were necessary to maintain constant shutter speeds for consistent photographic results. In addition, the parts had to be durable, low in cost, and require only a minimum of hand finishing.

Together, Argus engineers and Revere's Technical Advisory Service worked on these complex problems. It was agreed that brass be used because of its workability and freedom from corrosion. Revere supplied a special stretcher straightened brass strip stock held to plus or minus .0007 thickness tolerance.

That this Revere brass strip more than adequately answers all the Argoflex 75 requirements for special tolerances, precision, durability and low cost, is borne out by its performance in operation. Said the Argus people: "Your (Revere's) Technical Advisory Service assisted us in solving these problems to our unlimited satisfaction."

In order to determine how the camera shutter mechanism would stand up in use, Argus has designed the machine you see at left which automatically winds and snaps the camera. These tests which are constantly being made on current production show the life of the camera to be far greater than the number of pictures the average photographic fan takes in an entire lifetime.

Perhaps Revere Brass or some other Revere Metal can be of help in developing or improving your product —cutting your production costs. Why not tell Revere about *your* metal problems? Call the Revere Sales Office nearest you today.

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On the ASSEMBLY LINE

AUTOMOTIVE NEWS AND OPINIONS

Automatic transmissions here to stay . . . Companies in bandwagon movement . . . Ford plans new transmission in new plant . . . Gas turbine engine seen as no challenge.

by Walter G. Patton

Detroit—The growing popularity of automatic transmissions is evidenced by statistics in GM's annual report to stockholders. Hydra-Matic, for example, has now been installed on more than 1,600,000 passenger cars. This combination fluid coupling and automatic transmission was introduced by Oldsmobile in 1940 and made available on Cadillac in 1941. Pontiac adopted the Hydra-Matic in 1948.

Powerglide Output Gains

During the year 1949, 608,000 Hydra-Matic units were produced by the Detroit Transmission Div. Incidentally, in September nearly a quarter of a million sq ft of additional floor space became available when the company's new transmission plant on Plymouth Road west of Detroit was officially opened.

Buick has already produced more than 350,000 Dynaflow Drives. More than 70 pct of all Buicks sold in 1949 were equipped with these automatic transmissions.

Engineering work on the Chevrolet Powerglide transmission, it is disclosed, was started in July 1946. Final testing, tooling, and initial production in the plant just outside of Cleveland was begun late in 1949. Current output is now believed to be close to 1000 per day and three shifts of workers are being used, according to reports.

Packard has recently speeded its stride with its Ultramatic automatic transmission unit which locks mechanically into high gear. Recent reports indicate that 70 pct of all Packard cars are sold with automatic drive.

Ford Plans Transmission

Meanwhile, Ford is progressing rapidly with its plans for production of its new transmission at a new plant now building just outside of Cincinnati. While Ford may not reach the initial production deadline set for June, satisfactory progress is reported in tooling the Cincinnati plant. Large transfer-type machines are being tried out in producers' plants to insure satisfactory operation when they are installed at Cincinnati.

Experimental production of Borg-Warner units for Studebaker have been reported by the trade. At the present time, the volume is understandably low and will probably remain so for some time to come. Getting under production on an automatic transmission is one of the most difficult production jobs the auto industry has ever tackled. Oldsmobile, Buick, Chevrolet, Packard and now Borg-Warner and Ford can testify to this.

Hudson Opens Ontario Plant

Hudson has resumed operations at its Tilbury, Ont., plant. Originally started in 1932, operations were suspended during the war. Since the war, Hudson has been selling on an import basis through Hudson Motors of Canada.

The facilities of Chatco Steel Products Limited are being used for the assembly of Hudson cars in Canada. At the present time only the Hudson 1950 Pacemaker model is being built in Canada. According to Hudson officials, approximately 50,000 Hudsons are currently in operation throughout Canada.

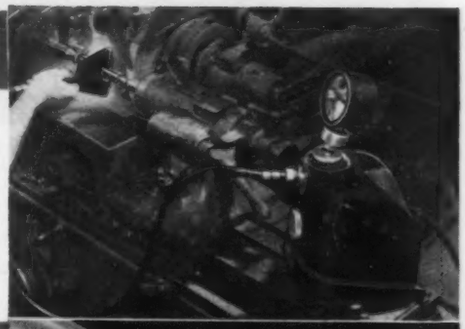
Auto Engineers Discount Claims for Gas Turbine Engines

Many automotive engineers are inclined to discount liberally loose talk about the possibilities of gas turbine engines for passenger cars. Some of the accounts in the press have confused jet propulsion engines with gas turbines. The industry in Detroit seems in-

3 NEW AIR-O-LIMIT DEVELOPMENTS

for Increased Speed and Greater Accuracy

Air-O-Limit Snap Gages

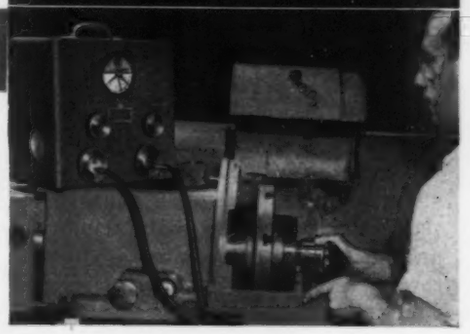


The design of the new P&W Model F Air-O-Limit Snap Gage provides unusual interchangeability and flexibility for checking work in the machine and in the inspection department. With four different frames and one set of adjustable carbide anvils, diameters ranging from ½" to 2½" can be quickly and easily checked.

Contact Gaging Plugs

The new P&W Air-O-Limit Contact Gaging Plug has been developed for checking diameters where the roughness of the bore surface finish does not permit accurate readings with regular air gaging plugs. Its easy-entry bullet nose design and a *unique design feature which provides adjustment for setup and wear of the carbide contact gaging buttons* give greater accuracy of measurement and insure long satisfactory performance.

Duplex Indicator



The new P&W Air-O-Limit Duplex Indicator permits two station gaging with greater speed and accuracy. This P&W development incorporates *in one meter* two independent gaging indicators with individual pointers thus permitting dual readings on the same dial. P&W Duplex Indicators can be applied to many multiple station gaging fixtures.

PRATT & WHITNEY

Division Niles-Bement-Pond Company

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It pays to buy

GAGES

on a performance basis

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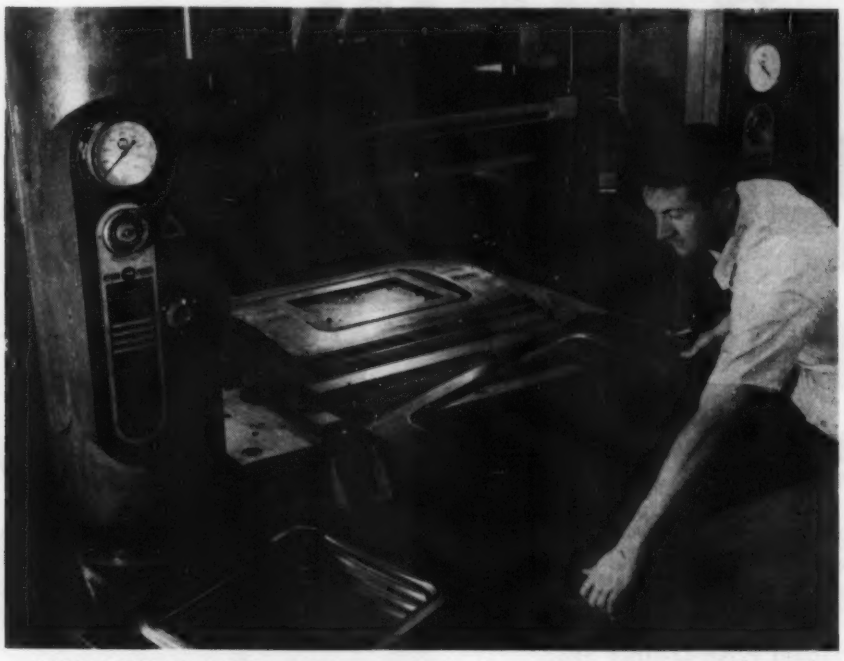


FROM DOOR TO DOOR: A triple action hydraulic press is drawing the outside panel of a bus back door. Made of 20-gage Otiscoloy, the sheet is given a 1-in. maximum draw. After the drawing action, the window is blanked with the same press stroke.

clined to take a "you've got to show me" attitude toward the recent development announced by an English manufacturer.

In a recent interview Charles A. Chayne, Buick chief engineer, argued that, in their present stage of development, gas turbines offer the motorist no advantages over the present powerplant. Chayne called attention to the complex assembly operations required and to the fact that fuel consumption may run three times as high as the conventional engine.

More Development Needed

In a paper presented at French Lick last year, W. A. Turunen, General Motors research enginer, observed that available heat-resistant alloys were not, at that time at least entirely satisfactory and these would have to be further developed to make a serious challenge to the reciprocative engines.

Chayne also mentioned that turbines reach peak efficiency at full throttle whereas the average motor car is rarely driven at wide open throttle. Another turbine disadvantage, Chayne said, was the difficulty in handling the volume of hot exhaust gases. The muffler would have to be nearly ten times as big as for a conventional auto engine, Chayne argued.

An air cleaner and silencer about three times as large as the conventional auto engine equipment would be necessary, Chayne estimated.

At the same time, Chayne did not minimize the inherent advantages of the gas turbine. A wide range of fuels could be used, he said. He specifically mentioned certain advantages referred to in Turunen's SAE paper, including maximum torque from a standing start, a simplified transmission with one gear change and possible elimination of the clutch. Chayne observed however, that turbines of the future are going to have to compete with more efficient reciprocating engines. In effect he intimated that the gas turbine may require quite a while before it catches the present reciprocating auto engine—if it ever does.

Packard Progress Described

Packard Motor Co. has made "tremendous progress" during the past 25 years, Hugh J. Ferry, president, told Packard workers recently at a dinner honoring 116 employees who have just completed 25 years of service.

Each of the 116 employees received 25-year pins and many were awarded Packard Senior League rings. In addition, the company voluntarily assumes life insurance payments on the group policies they hold.

Jeep Prices Go Down

Price reductions ranging from $120 on the 6-cylinder station wagon to $40 for the 6-cylinder Jeepster have been announced by Willys-Overland.

The price cuts will apply to all units of the company's 1950 line of Jeeps, passenger cars and trucks except the sedan delivery, civilian Jeep and the 4-wheel drive station wagon.

The company's new ½-ton truck is priced at $1,220. It will be powered by a new "Hurricane" engine with a compression ratio of 7.4 to 1, according to Lyman W. Slack, vice president in charge of distribution.

Frazer Price Sinks a Bit

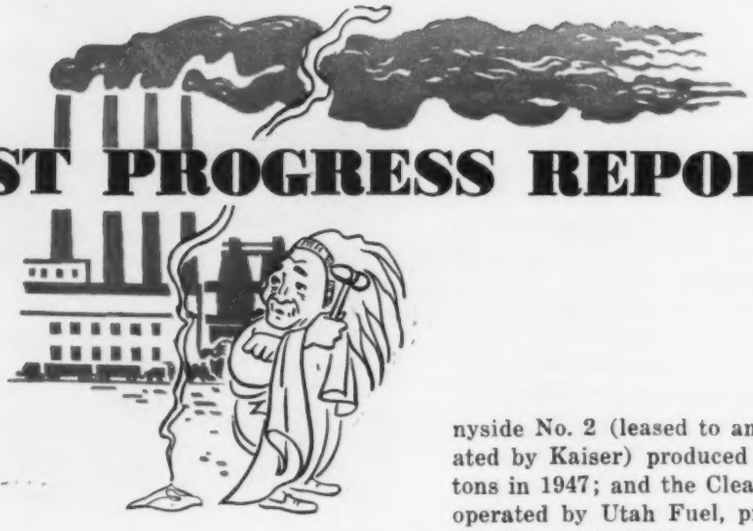
The new 1951 Frazer models will deliver for $2,359 at the Willow Run factory including federal excise taxes. This compares with a factory delivered price of $2,395 on the 1950 Frazer sedans.

The company has set a delivered price of $2,399 on the 1951 Frazer "Vagabond" utility sedan, a new Frazer addition patterned after the Kaiser Traveler. New 1951 model Kaisers are scheduled to be delivered to dealers at the end of this month.

Ultramatic Demand Grows

The continued public demand for automatic transmission is reflected in the announcement that 85 pct of the cars produced by Packard Motor Car Co. in 1950 have ultramatic drive.

Karl M. Greiner, vice president and general sales manager, has announced that 1950 output has already doubled the entire 1949 total. Packard has recently reduced the price of its Ultramatic drive from $225 to $185, including federal excise taxes.



WEST COAST PROGRESS REPORT

Utah Fuel Co. coal reserves won by Kaiser's Book Cliffs . . . U. S. Steel interest denied . . . Outside steel bought for building boom.

Digest of Far West Industrial Activity

by J. J. Reinhardt

San Francisco—Steel men of the West found far more interesting reading between the lines than in the printed newspaper reports on the bidding for the 100,000 shares of Utah Fuel Co. capital stock which last Friday went to the Book Cliffs Coal Corp. on its bid of $6,800,000.

Kaiser Interests Grow

To many it looked like another contest between Kaiser Steel Corp., which controls Book Cliffs, and the U. S. Steel Corp. which nowhere appeared in the bidding. Steel Corp. officials and representatives of the Minerals Development Corp., which had entered a bid of $6,725,000 in cash and later offered to meet Book Cliffs' bid, both refused to admit or deny that U. S. Steel was interested.

The western steel trade recalled the lease of 2560 acres of coal deposits with reserves of approximately 30 million tons which Kaiser Steel Corp. secured from the U. S. Dept. of Interior over the protest of U. S. Steel, which also had sought to lease this property in 1948. (THE IRON AGE, June 23, 1949, p. 98.)

Control of the Utah Fuel Co. brings the Kaiser interests to three mines in Utah and three in Colorado and 297 beehive coke ovens. Productive capacity of these mines is estimated to be 2 million tons of coal and 100,000 tons of coke annually. Total coal reserves on 40,000 acres of land are estimated to be 109 million tons.

Utah's Three Mines

The three mines in Utah are: Castle Gate, operated by Utah Fuel, produced 555,654 net tons in 1947; Sunnyside No. 1 (operated by Utah Fuel which sold coal to both Kaiser and Geneva) and Sunnyside No. 2 (leased to and operated by Kaiser) produced 391,891 tons in 1947; and the Clear Creek operated by Utah Fuel, produced 264,676 tons in 1947.

These Utah mines alone constitute a choice plum for any blast furnace operator and especially to U. S. Steel, which now owns through subsidiaries the Columbia mine, which produced 414,438 tons in 1947, and Horse Canyon mine.

Kaiser in Good Shape

Capacity operations of Geneva Steel Co.'s 252 Koppers-Beckers coke ovens in Utah requires approximately 1,700,000 net tons of coal per year, and capacity operation of Kaiser's 135 Koppers-Beckers ovens at Fontana, Calif., require approximately 825,000 net tons of coal per year.

Kaiser's long term lease with Utah Fuel Co. for Sunnyside coal, which probably would have held regardless of ownership, and the estimated 40-year reserve on land leased from the Dept. of the Interior and 480 acres leased from the state of Utah, put that company in better than fair shape for coal.

Railroad Is Claimant

With acquisition of the Utah mines, Kaiser now controls the coal bearing lands on both sides of U. S. Steel's holdings.

These are some of the considerations which led to the conjecture that U. S. Steel Corp. may have been interested financially in the Minerals Development Corp. which had been organized by the management of Utah Fuel Co., headed by president Claude P. Heiner.

In the Salt Lake City area it was

believed someone other than the management of Utah Fuel was providing financial backing and U. S. Steel appeared to be the logical participant. It is understood that officials of Utah Fuel had sought such financial support, but it is not known how successful these overtures were.

Utah Fuel Co. was organized by the Denver and Rio Grande Western Railway in 1900 and the entire capital stock of 100,000 shares was pledged to guarantee the bond issue. The first $6 million from the sale of the stock will go to make up deficiency in these bonds and any excess will be sought by other claimants, of which the railroad is one.

Assets of the company were listed at the end of 1948 as $20,922,180, which included capital stock of eight subsidiaries valued at $1,155,911. Property was valued at $17,181,680. Total income has ranged in a ten-year period from $2,005,053 in 1938 to $7,533,734 in 1947, and the net ranged from $45,806 in 1938 to $530,099 in 1947.

Claude Heiner is the son of the late Moroni Heiner who was president of the company from 1932 to 1948. Directors are Salt Lake City residents.

West Coast Building Booms; Some Outside Steel Purchased

Los Angeles—Construction firms have enjoyed a renewal of interest in large projects during the past two months. Contracts have been let for an increasing number of major buildings here.

While this increase in construction means more business for warehouses and mills, not all of the steel is being bought locally.

Many of the construction firms are showing greater interest in imported German and Belgian steel and some have orders in for the overseas products.

German Rod Bought

Typical of the firms looking into the foreign market is the William J. Moran Co., which is experimenting with German steel.

For one of its projects, an 11-story apartment building, the company purchased 580 tons of German reinforcing rod.

Company owners believe that their deal worked out in such a way as to save about $20.00 a ton. They worked from a base price of $62 delivered here and extras were about the same cost as those of the local mills. For the same order they were quoted a price of $82.50 from domestic sources.

They found it took from two to three months for delivery, but the steel was of good quality and met their ASME specifications. The deformities were about the same as rods produced here, and they were able to bend and fabricate the reinforcing on the job.

Imported Steel Cheaper

Currently, the company is investigating prices on sheet piling for work on a project at Terminal Island where firms are being forced to build up a sea wall to make up for the sinking of the land. They will build the wall where the land has dropped five feet in a few years. While they have yet to shop around seriously, preliminary prices indicate about $130 a ton from domestic sources and about $100 for the imported steel. There may be some changes in these prices with negotiation.

One of the largest construction jobs in southern California is the Lever Brothers plant in this area. The buildings are being erected by the Bechtel Corp. Recently subcontracts were let to Bethlehem Pacific for 1900 tons of reinforcing steel and 1200 tons of structural steel.

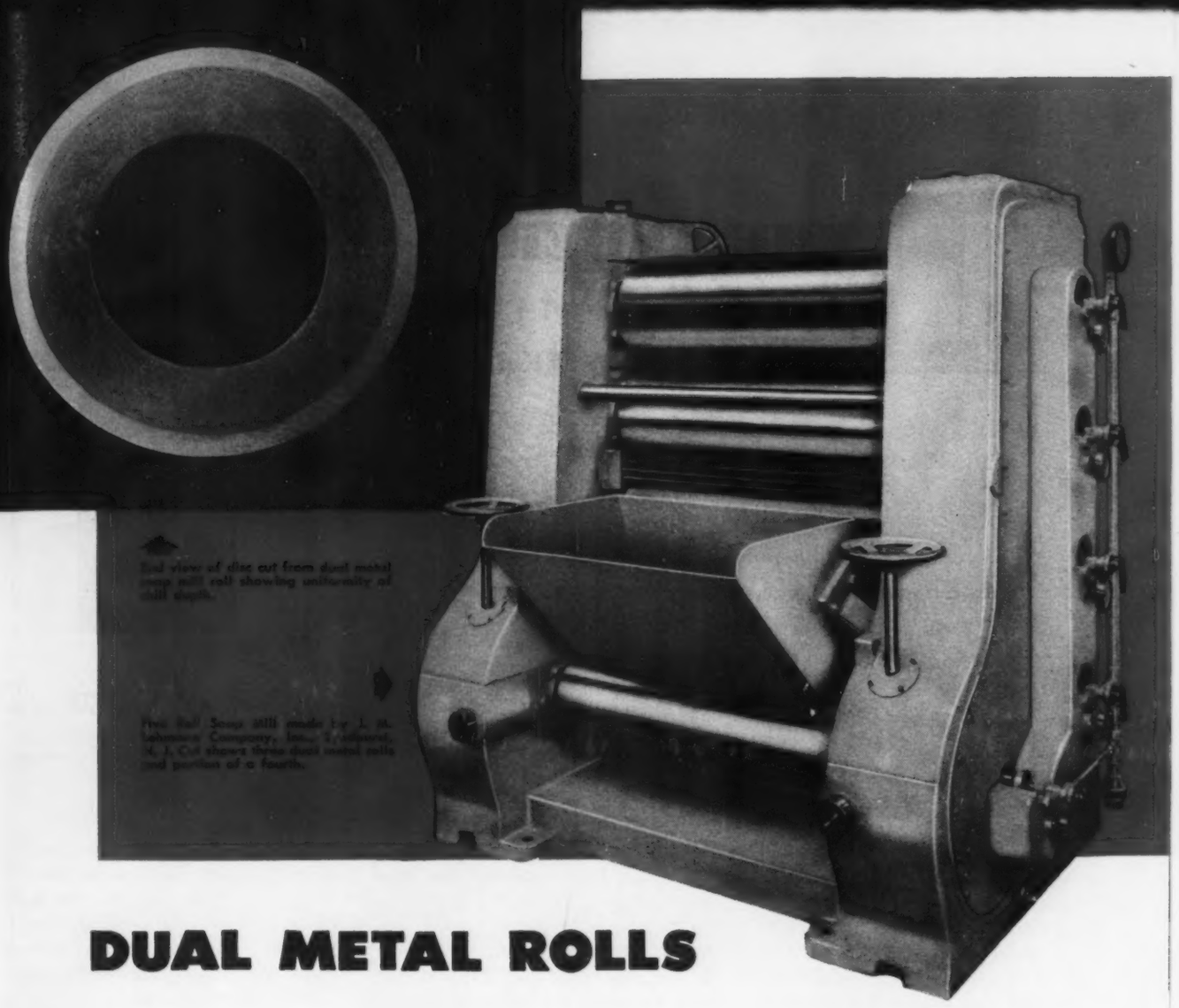
Latest reports on the Statler Hotel which is to be built in Los Angeles indicate that 10 contractors are working on bids. The hotel will have 1275 rooms in addition to office space and will be the largest such project undertaken in this area since the end of the war. Bids for the work will be opened in the hotel company's executive offices in New York on May 15.

This renewed interest in construction here has not as yet had an impact on employment. February figures on construction employment just released by the California Department of Industrial Relations show 160,800 employed as compared to a January total of 161,300 and a February 1949 total of 173,700.

MIGHTY MITE: On a road outside Seattle a Kenworth Motor Truck Corp. vehicle powered by the pygmy-size Boeing Airplane Co. gas turbine engine takes a break after road testing. Alongside is the truck's twin brother, powered by a conventional diesel with the same 175 hp. The gas turbine weighs only 200 lbs. and occupies 13 pct of the space taken by the diesel.

To Hold Vote for Union

Salt Lake City—Clerical workers of the Geneva Steel Co. are scheduled to vote on a proposition to unionize and affiliate with the United Steelworkers of America, April 20 and 21. The election will involve approximately 250 workers at the Geneva plant and 20 at the Ironton plant.



End view of disc cut from dual metal soap mill roll showing uniformity of chill depth.

Five Roll Soap Mill made by J. M. Lehmann Company, Inc., Lyndhurst, N. J. Cut shows three dual metal rolls and portion of a fourth.

DUAL METAL ROLLS

Centrifugally cast dual metal roll shells have found wide acceptance with equipment builders who use chilled iron rolls for grinding or processing such commodities as ink, paint, pigments, chocolate, paper, flour, cereals and soap.

One of these equipment builders is the J. M. Lehmann Company, Inc. of Lyndhurst, New Jersey, who has standardized on our centrifugally cast dual metal chilled iron-gray iron rolls for their soap, ink and chocolate mills which they identify as "CDM" Rolls (centrifugally cast dual metal), a Lehmann trademark.

Utilizing centrifugal force and temperature, our dual metal casting process makes possible the production of grinding and processing rolls requiring a hard outer shell of white iron for the wearing surface and a soft, readily machinable gray iron core to facilitate the insertion of driving shafts. These two dissimilar metals are cast separately but are metallurgically bonded so as to provide an *accurately controlled and uniform chill depth and also uniform hardness* in both the hard outer shell and the soft gray iron core.

A number of two-metal cylindrically shaped combinations are now being made for equipment manufacturers who require metallic structures which have two working surfaces and where performance requirements imposed on these surfaces are quite dissimilar.

TYPES OF DUAL METAL CAST

Gray or alloy iron inside steel; gray iron or Ni-Resist inside chilled iron, tool steel or Ni-Hard; gray iron inside stainless steel; stainless steel inside carbon steel; and many other metallurgically bonded two-metal centrifugally cast combinations.

SINGLE METAL CYLINDRICAL CASTINGS

Carbon, alloy and stainless steel; gray and alloy iron including Ni-Hard, Ni-Resist and special chemical piping.

SIZE RANGE

Outside Diameters — 4" through 30".
Wall Thickness — ½" up.
Lengths — Up to 10'.

U. S. PIPE AND FOUNDRY CO.

SPECIAL PRODUCTS DIVISION

BURLINGTON, NEW JERSEY

AMERICA'S LARGEST PRODUCER OF CENTRIFUGALLY CAST FERROUS METAL PRODUCTS IN TUBULAR FORM

THE FEDERAL VIEW

THIS WEEK IN WASHINGTON

Venezuelan ore find is point of ore monopoly probe . . . Seaway advocates fear discovery weakens arguments . . . Steel prices investigation still continuing.

by Eugene J. Hardy

Iron ore is making considerable news on Capitol Hill. The Monopoly Subcommittee of the House Judiciary Committee kicked off its U. S. Steel probe this week by delving into steel company ore holdings. Next week, the House Public Works Committee will open hearings on the St. Lawrence Seaway and iron ore will again play an important part.

Too Large a Share?

U. S. Steel's Venezuelan discovery appears to be one of the major points of interest in these unrelated hearings. The monopoly probers fear that these large new deposits give U. S. Steel too large a share of the ore that is available to the steel industry. Proponents of the Seaway project wonder what this new discovery will do to their arguments that the Labrador-Quebec ore deposits make construction of the Seaway a must.

The Administration's position on the Seaway will be presented to the committee largely by the Commerce Dept., although it will be a reflection of the views of a number of agencies, including the National Security Resources Board.

Since it was first established, NSRB has been studying the iron ore situation. Generally speaking, the viewpoint of those responsible for industrial mobilization is that Mesabi ore could not support another war and, therefore, every potential source of ore should be developed.

Two proposals have been advanced regarding the Mesabi range; (1) leave a portion of this ore in the ground as an ever-present reserve, meanwhile, increase imports of foreign ores for domestic consumption; and, (2) stockpile ore near consumption points, in view of the vulnerability of the Soo locks.

Decision in Offing

A decision has not yet been made as to whether either one or both of these proposals should be put into effect. Such a decision might be in the offing now that former Air Secretary Stuart Symington has taken over the long-rudderless NSRB.

Hearings on the Seaway are almost perennial, but it had been hoped that this time the need for Labrador-Quebec ore might go a long way toward selling skeptical Congressmen on the essentialness of the project which would provide quick transportation to the Lake ports. The Venezuelan discovery, however, has just about finished these high hopes, national security needs notwithstanding.

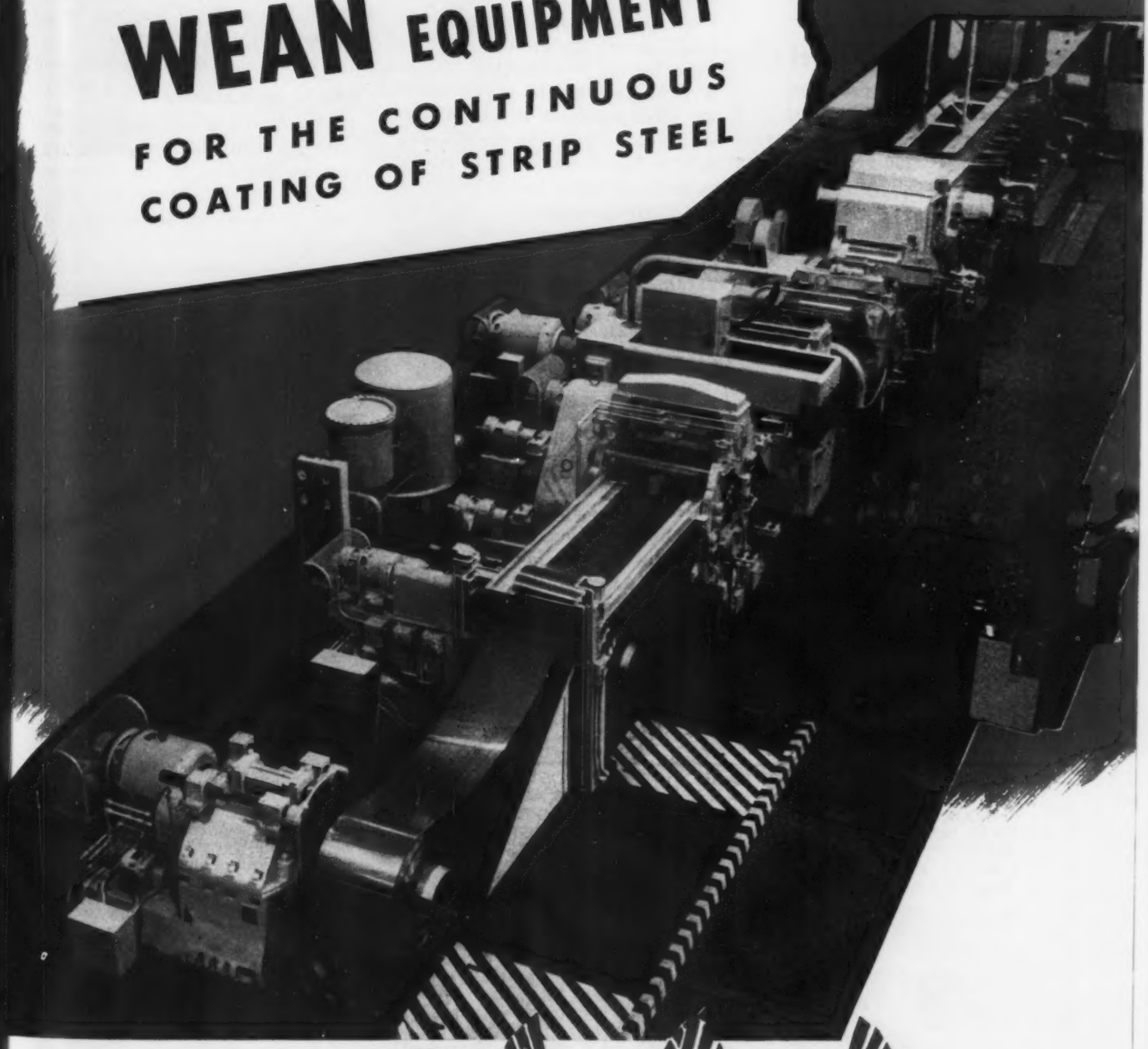
No Applications Expected

While there was never more than a one-in-a-million chance for favorable action on the Seaway during the present session of Congress, development of South American deposits, including transportation facilities, with private funds will not help to convince wavering legislators of the need for the Seaway as an artery for iron ore.

From still another angle the Venezuelan discovery has changed the situation. In some government quarters it had long been hoped that Reconstruction Finance Corp. loans would be made available for beneficiation of low grade Mesabi ores, although no formal application has ever been filed. Top RFC officials now admit that if a loan application for this purpose were filed the Venezuelan discovery would figure largely in the final

WEAN EQUIPMENT

FOR THE CONTINUOUS COATING OF STRIP STEEL



THE Wean Engineering Company is meeting today's demands for equipment to produce tin plate and zinc coated strip steel with light coatings by the electrolytic method; also equipment to produce chemically treated black plate and strip steel. Equipment for coating strip steel with zinc and other materials by the hot dip method is also available.

The WEAN ENGINEERING COMPANY, Inc.
Warren, Ohio

Associate Company—Wean Equipment Co.—Cleveland, Ohio

SPECIALISTS IN SHEET, TIN AND STRIP MILL EQUIPMENT

decision. But they really don't expect any.

Justice Dept. Suit Not Aimed at U. S. Steel—Not Yet

Is the Justice Dept. preparing to file an anti-trust suit designed to break up the United States Steel Corporation? At the present time, the answer is "no." As to the future, the possibility would appear to be a pretty fair even-money bet.

About all the Justice Dept. will admit publicly is that the Anti-Trust Division began an inquiry into steel prices about two years ago at the President's request and that this study is still going on.

On the surface this would appear to have little significance, but the Justice Dept. announcement in Feb. 1948 emphasized that the study was aimed at "recent price increases" to determine whether there was "any agreement among the steel producers in violation of the anti-trust laws." The price increases which caused the investigation were the now-famous boosts on semi-finished steel which created such a stir in Washington. (THE IRON AGE, March 11, 1948, p. 156.)

Common sense would seem to indicate that the need for a study of these minor price increases has long since disappeared. There would be only two practical reasons why the Justice Dept. is still studying steel prices as it indicated it might do: (1) Evidence of agreement had been discovered in regard to postwar price increases, a not too likely development; or, (2), there is a concerted effort to turn up something more significant regarding the alleged leadership of U. S. Steel. The latter is the more logical conclusion.

Inquiries Delay Suit

A suit against U. S. Steel aimed at "divestiture, divorcement and dissolution," a seldom-used process instituted by former Attorney General Tom Clark, would be in keeping with the Justice Dept.'s current line of action, as evidenced by the suits now pending against such firms as A&P and DuPont.

The institution of such a suit would not likely be started until after the Monopoly Subcommittee of the House Judiciary Committee completes its probe of U. S. Steel. The investigation of integration in the steel industry being conducted by the House Small Business Committee should also serve to delay any action that might be brewing.

Efforts to Intensify

Should either of these probes come up with anything indicating possible violation of the monopoly statutes, the efforts of the Anti-trust Division would undoubtedly be intensified.

It would appear that U. S. Steel is boxed in by critics on Capitol Hill who say that the answer to bigness is government control and others in the executive departments who say that breaking up the industry is the only solution. For the present, at least, the latter course of action is the one that is more likely to be followed.

In one of the latest studies to be conducted by the Labor Dept., it is indicated that the iron and steel industry has a better record for granting severance pay in its labor contracts than numerous other industries as well as industry as a whole.

Dismissal compensation is granted in about 12 pct of the steel contracts studied.

The report indicates that about 8 pct of all labor contracts studied, about three-fourths of which involved manufacturing industries, contain provisions for severance pay when such dismissal comes about through no fault of the discharged employee. This is an increase of 3 pct since 1944 when the last such study was made.

Dismissal pay is also concentrated within certain industries—particularly in the printing trades where the typography union has long been strong. A high rate is also found in the rubber, mining and petroleum industries.

Nevertheless, even in those industries where such provisions are the highest, such labor contract clauses vary widely as to causes and conditions under which severance pay is granted. The amounts due as well as the length of service required for eligibility also differ greatly.

THE BULL OF THE WOODS — By J. R. Williams

NO, NO, NO! NOT ON YOUR LIFE! NO, HAMP, I WON'T ALLOW IT!
SEE TH' GUY EASE IN AND JUMP OUT? HE TOLD ME HE WAS GONNA HIT TH' BULL FOR A NEW LATHE CHUCK, BUT HE THINKS HE'S FOUND HIM IN A BAD "NO" HUMOR!
"NO" IS JUST AS DECEIVIN' AS "YES"! TH' BULL'S REALLY IN HIS BEST HUMOR--HE'S REFUSIN' TO LET HAMP TAKE A DIRTY JOB!
4-21
J.R.WILLIAMS
THE NOES HAVE IT
T. M. REG. U. S. PAT. OFF.
COPR. 1948 BY NEA SERVICE, INC.

The Metal Industry Takes to Powder

THERE is enough powder in this issue to blow you right out of your chair, especially if you're the complacent, world-by-the-tail kind of a guy. It is packed with the latest wrinkles of the powder metallurgy industry.

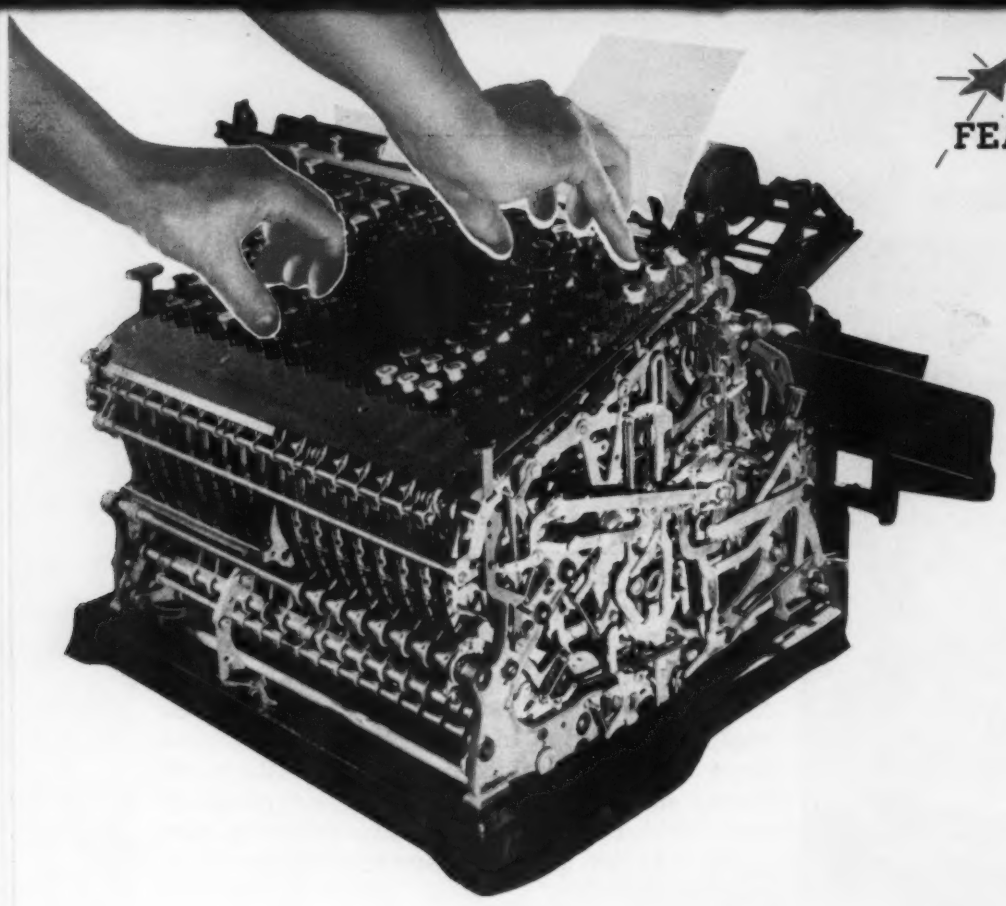
What is powder metallurgy? Pull out your Zippo. See that odd shaped lug on the left? It's a powdered iron part. Why? Because it's better and cheaper, that's why, and so are thousands of other parts these days. Your car is honeycombed with such parts; so's that new washer, the parking meters, that adding machine over in the corner. More are on the way. This industry is a comer.

Maybe you make hell-for-strong forgings, or castings, or machine tools and are therefore immune. The presses, furnaces and machinery in the metal powder game aren't so little. They use your kind of stuff. Maybe you should know more about these powder people. They're smart, they're cagey and they're good. They have to be; many of them are small one-man shows. If you meet these fellows you'll find that older industries don't have all the ideas, or brains or angles. Just glance through the next few pages, see for yourself.

Metal Powder Show

THE Metal Powder Assn. will hold its annual meeting next week in Detroit. The two-day meeting, Apr. 25 and 26, will feature technical sessions and exhibits of the latest developments in the powder industry.

Brass Powder Photo Courtesy New Jersey Zinc Co.



Powder Parts ADD UP

Powder parts to very close tolerances are being used to replace parts made by conventional methods. Precision to 0.001 in. is not uncommon in accounting machines. Powder parts are formed to such tolerances and need no further machining.

By PETER MONDY,
Chief Product Design Engineer, Burroughs Adding Machine Co., Detroit

BURROUGHS ADDING MACHINE CO. is employing powdered metal parts for some of its adding and accounting mechanisms. In cases, powdered metal parts are replacing orthodox parts in existing products. The reason is two-fold: functioning operation has been improved; and/or substantial savings have been effected.

In the process of introducing powdered metal, Burroughs has encountered some of the usual problems. Often a change to powdered metal cannot be made without the redesign of adjacent parts. That problem is not present, however, when powdered metal parts are used in newly de-

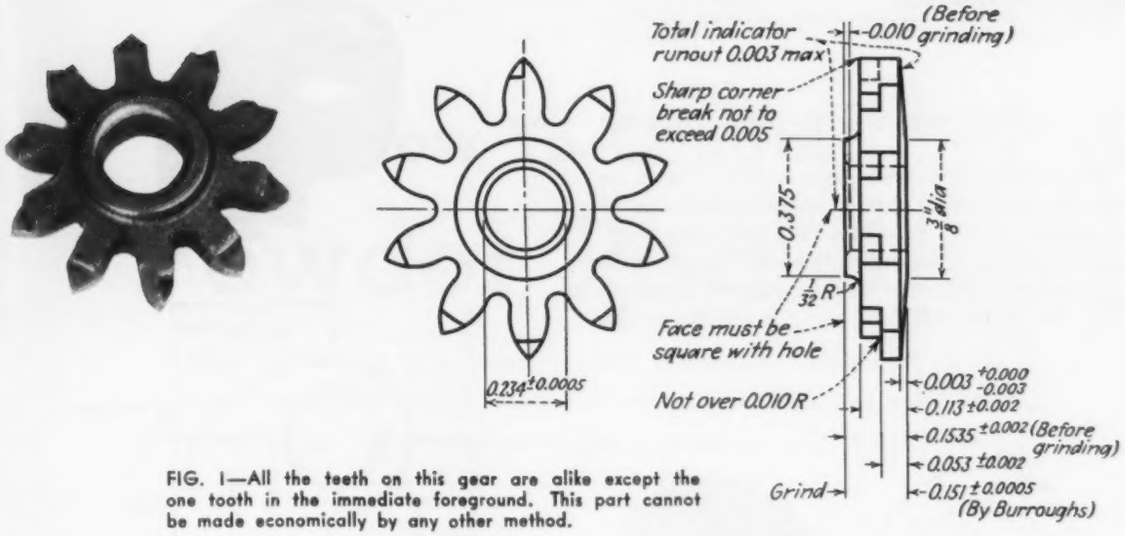


FIG. 1—All the teeth on this gear are alike except the one tooth in the immediate foreground. This part cannot be made economically by any other method.

signed mechanisms. In these instances, Burroughs is using powdered metal wherever it can be applied to good advantage from the point of view of both quality and cost.

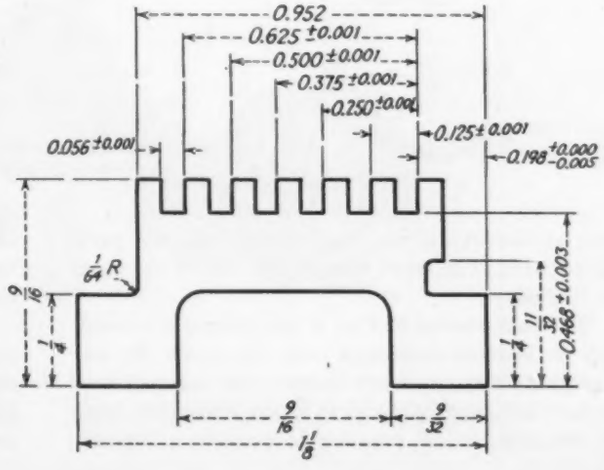
Precision is of the utmost importance in the manufacturing operations. With as many as 10,000 parts in some machines, tolerances of 0.001 and under are not uncommon. In many instances, therefore, Burroughs' engineers favor powdered metal parts when it is possible to obtain the necessary dimensional precision and at the same time to effect substantial savings. The self-lubrication characteristics of powdered metals have been employed to good advantage in places where it would be difficult to obtain lubrication in the orthodox manner.

Testing standards are designed to eliminate any possibility of any defective parts going into a machine. Experience has indicated that if a powdered metal part fails, it will do so very early in ordinary operation. Standards of acceptance involve impact loads at least five times greater than the actual application requires. All breakdown tests must be the equal of not less than 10 years of severe usage in the field. Standard inspection procedures include density, composition of powder and porosity of the part. It has been Burroughs' experience that, in order to obtain satisfactory results, extreme care is required in the design of the molds and adequate quality control must be exercised through all stages of fabrication.

The part shown in Fig. 1 is very difficult to produce economically by any other method. It might be possible to coin the part or to assemble it from two stampings. Either of these methods, however, is impractical. The part could also be produced as an investment casting, but the cost of this process would be excessive. The unusual cuts on the face of the teeth of this gear should be noted.

The guide block shown in Fig. 2 requires some lubrication between the sliding index fingers and the block. By using powdered metal, permanent lubrication is provided. The cost of this part has been reduced from that of the former method,

FIG. 2—Permanent lubrication of this guide block is possible through powder metallurgy.



which involved machining the block from bar stock.

The combination brace and bearing shown in Fig. 3 is made from powder bronze containing 90 pct copper and 10 pct tin. This part was redesigned to provide an adjustable and permanently lubricated surface for the bracing of a shaft which fits in the 0.377-in. bore. A nut fits in the slot shown in the drawing which locks the part in position. The small hole at the end of the part is drilled.

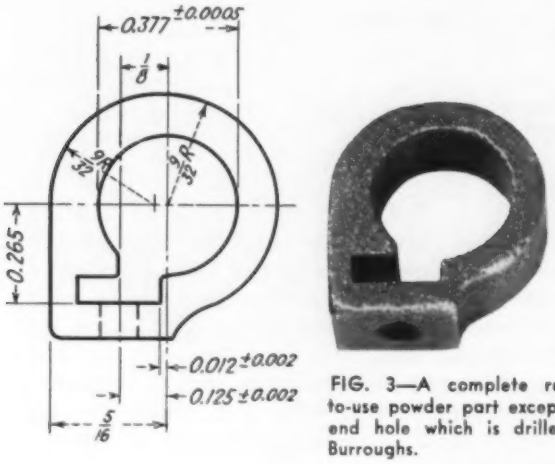


FIG. 3—A complete ready-to-use powder part except the end hole which is drilled at Burroughs.

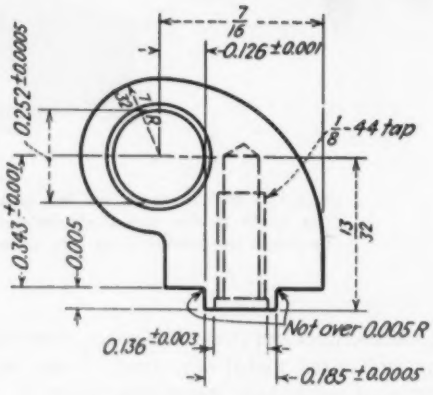


FIG. 4—Required accuracy was obtained at much less cost by making this part from powdered bronze.

The part shown in Fig. 4 was formerly a solid bronze bearing machined from bar stock. By redesigning for powdered bronze, the required accuracy has been obtained at much lower cost, and it was also found possible to provide a limited adjustment for aligning purposes. Present design has resulted in savings in both manufacturing and assembling costs.

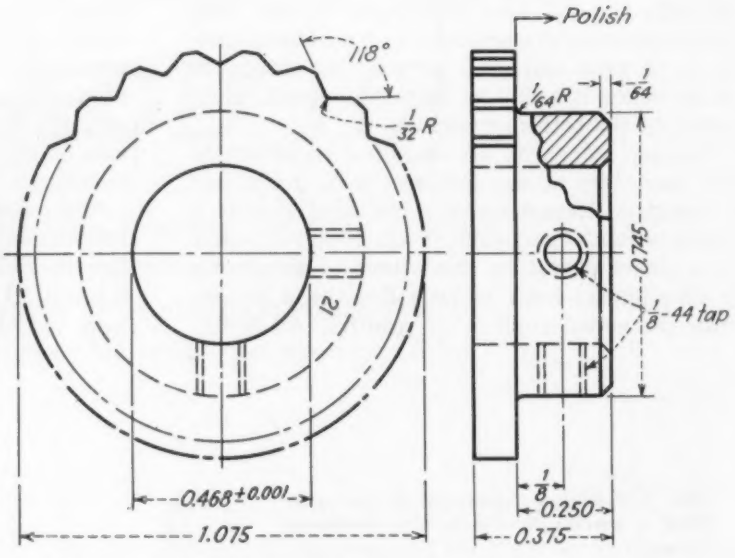


FIG. 5—One of the larger powder parts used in accounting machines. This wheel is made from powdered iron.

Fig. 5 shows a detent wheel used for positioning the platen of a desk model bookkeeping machine. Formerly completely machined, substantial savings have been effected through the use of powdered metal.

How To Control
Powder Part Size

Mass production of a powder metal distributor bushing at Ford Motor demanded precise control of tolerances. Rejections were cut about 90 pct after statistical quality control was put in operation.

By E. E. ENSIGN,
Manufacturing Research

I. A. DeGROTE
Quality Analysis

Automotive Manufacturing Operations, Ford Motor Co., Dearborn

STATISTICAL quality control methods were applied in July 1949 to the manufacture of powdered metal bushings at the Ford Motor Co. Rouge Plant in Dearborn.

Powdered metal bushings used in automobile production are, of necessity, precision parts. The tolerances of the inside diameter, outside diameter and concentricity are seldom greater than 0.001 in. and often only 0.005 in.

The specific problem involved the distributor base bushing which serves two functions in the assembly; its inside diameter is the bearing for the distributor cam shaft and its outside diameter is the bushing for the breaker plate as shown in Fig. 1. Any excessive variation in the dimensions or eccentricity between inside diameter and outside diameter may cause binding of the shaft or wobble in the breaker plate assembly. These defects could result in faulty operation of the distributor.

The tolerance on this particular bushing are 0.0005 in. on the outside diameter, 0.001 in. on the inside diameter and a total indicator reading of 0.001 in. on concentricity.

When the bushing was first produced it was checked consistently only after the part was com-

FIG. 1—The distributor bushing in the foreground is made to close tolerances as excessive variations in diameter or eccentricity could cause faulty operation. The bushing is shown pressed into place at the left. The shaft works on the ID and the distributor head fits on the OD. At the right is the completely assembled distributor.

pleted, with the result that approximately 10 pct of the finished parts were rejected because of variations beyond the specifications on the outside diameter and the concentricity. This figure was excessive since scrap figures on a powdered metal operation usually should be under 1 pct, and a request was made by the production dept. that a statistical quality control study be made of the process.

The first study was made on the outside diameter by means of frequency distribution charts covering each operation in the process. The distribution showed that the bushing was tapered as a result of the forming operation. Fig. 2 shows a study made in July 1949 and one made in March 1950.

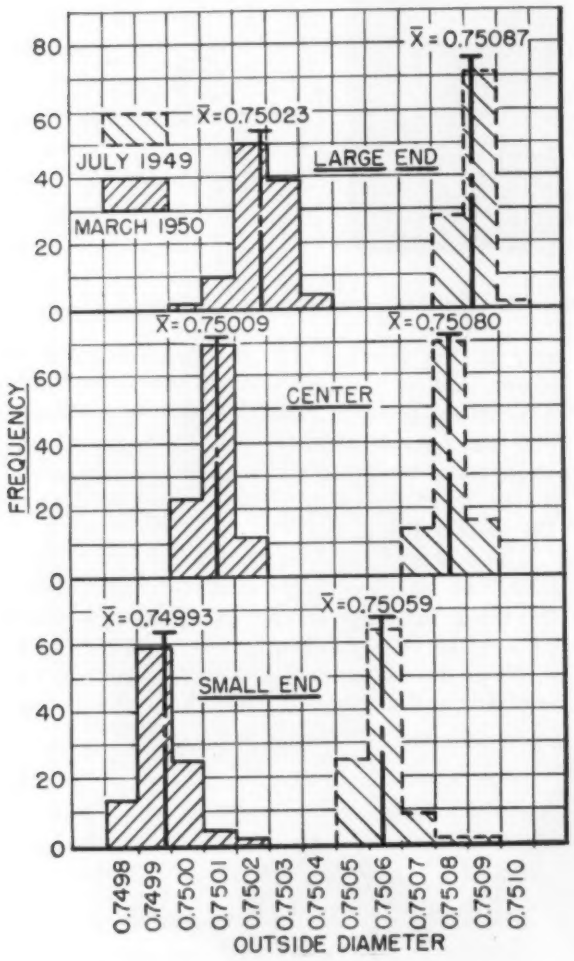


FIG. 2—Extent of taper found in production on the OD of the part after forming.

In the sintering operation, the ends of the bushing "grew" more than the center; in fact the center sections in some cases showed a slight shrinkage. The diameter of bushing increased an average of 0.010 in. at the ends. As a result

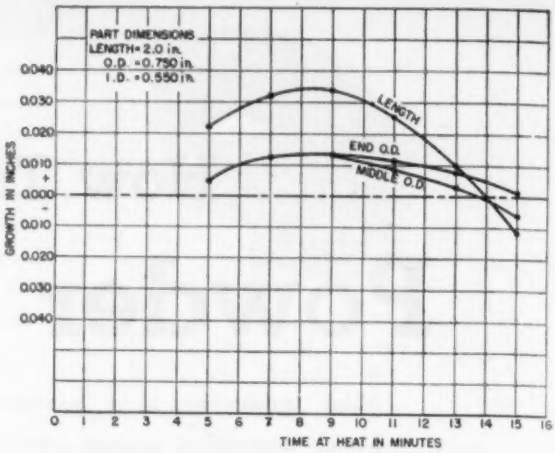


FIG. 3—Growth of bushing as effected by time and temperature. Furnace temperature was 1550° F.

of the first studies the manufacturing operations were improved. To eliminate the taper found in the formed part, changes were made in the forming presses to equalize the distribution of density. By changing the sintering cycle, the temperature and time, the variations in outside diameter was dropped from 0.010 in. to 0.001 to 0.002 in.

The improvements in the manufacturing process were developed by the manufacturing research dept. through studies of all variables in the process. Fig. 3 for example shows the dimensional changes or growth as affected by variations in the time intervals through the sintering furnace. This chart is for a similar bushing and shows the time interval at which the minimum differences in growth are obtained for a given furnace temperature. The same type of study is made for each part produced and at a range of furnace temperatures to obtain the optimum

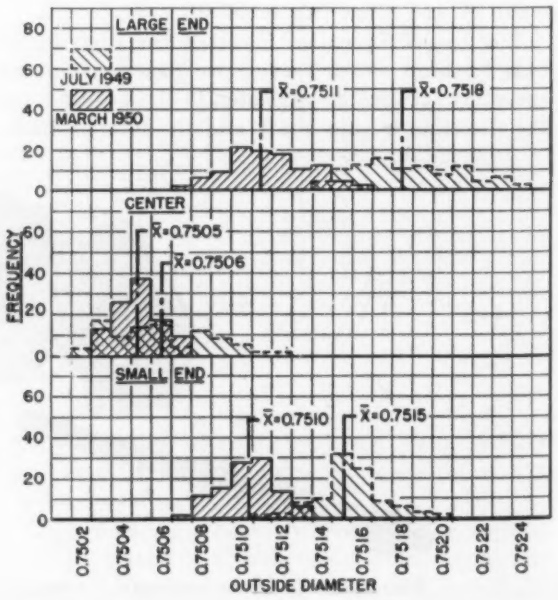


FIG. 4—Improvement made in controlling growth during sintering.

sintering conditions. Fig. 4 shows the improved condition for July 1949 and the subsequent improvement as indicated by the March 1950 checks.

In order to get the desired surface finish an allowance was made at the restrike operation for additional stock which would permit a centerless grinding operation on the outside diameter. Fig. 5 shows the difference in outside diameter after restrike between July 1949 checks, which were too small at the center to permit grinding, and the March 1950 checks. The uniformity of diameter and narrow spread or dispersion is shown in Fig. 6—all parts being well within the 0.0005 in. tolerance.

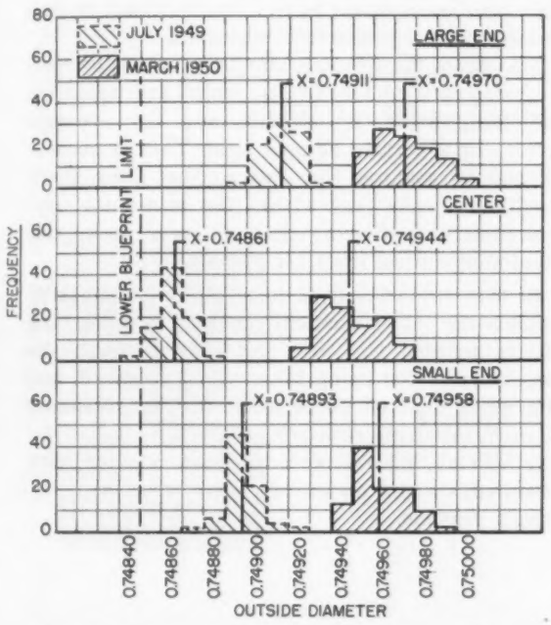


FIG. 5—Closer control of OD of part by restriking. Sufficient stock is left to permit cleanup in grinding.

The major problem, however, was the concentricity of inside diameter with outside diameter (specifications 0.001 in. total indicator reading). The results of the restrike operation, shown in Fig. 5, indicate that the desired correction in diameter was not obtained and the same was found of the concentricity.

In view of the fact that the amount of eccentricity correction attainable on the restrike operation was limited and the fact that the results appeared to be closely correlated with the forming operation, process control charts (X and R) were started at this point in the process.

These charts, known as charts for variables, are used to show averages (X) and ranges (R) and can be used wherever characteristics are measureable, whether the measurements are in size, weight, hardness, temperature, humidity, grain size, microinch finish, etc., or as in this case, concentricity. Fig. 7 is the type of chart used on the forming operation although this particular one covers the restrike operation. The improvement in the operation is shown by comparing the later checks on the right with the earlier checks shown on the left half.

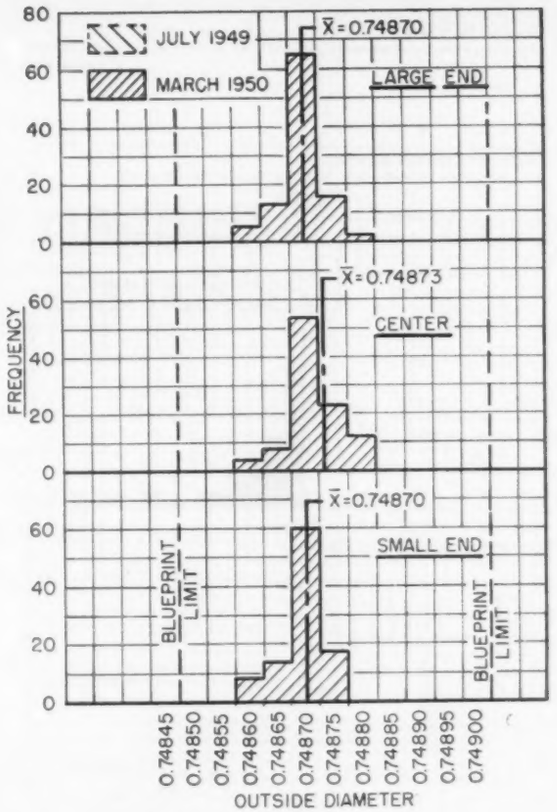


FIG. 6—Frequency of size within blueprint limits after grinding.

Five consecutive parts are taken from a machine by the inspector as often as is deemed necessary by the quality control analyst, based on past performance.

The total indicator reading (eccentricity) is recorded for each part on the work sheet, and the average of the five calculated and plotted on the average chart by the inspector. The difference between the highest and lowest reading of the five is the range and is plotted on the range chart.

The broken lines are the upper and lower control limits which are derived from a formula based on the average range and a constant which is dependent upon the size of the sample taken. In this case five pieces comprised the sample lots.

These limits are such that, *if no change has occurred in the process* since the limits were established, there are only about three chances in a thousand of a point falling outside. Therefore, if a point does fall outside it means that there is practically always an assignable cause which may be found if one investigates immediately. Thus the operator, job setter and foreman, by observing the charts, are able to detect trends or points out of control which require action. By making the necessary corrections, as indicated by the charts, production of defective parts is prevented or at least held to an absolute minimum.

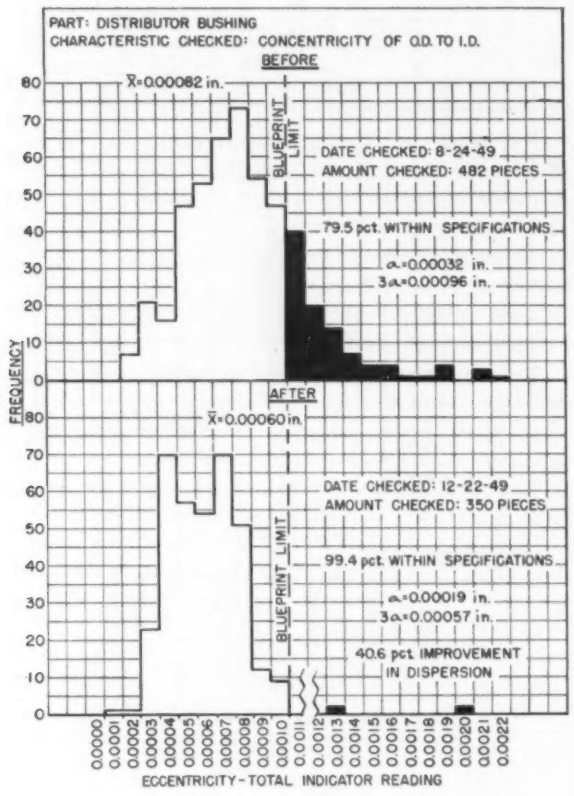


FIG. 8—Histogram shows variation in size before and after statistical quality control was put in effect.

The usual corrective action necessary was a realigning of dies, the changing of a worn punch, or a change in the mixing of the materials used. Fig. 8 shows the improvement in the concentricity in the form of a histogram for the before and after condition.

If the inspector's checks indicate that the machine is running in control he releases the parts produced since the last check. If his check shows the machine to be out of control the foreman is notified and the material run is held for further investigation and subsequent disposition. In this way large quantities of parts do not become contaminated by a few of inferior quality in the case of improper control.

Practically all other powdered metal parts in this same department have a control chart in use at one or more points in the process.

Maximum die life can also be attained by setting standard control limits, which are based on the specification, a constant, and the average range for a certain sample size. This is accomplished by making the dies so that they start producing parts just within the minimum control limit and allowing them to wear up to the maximum control limit for averages.

In this application, as in any other successful application of statistical quality control, the charts pointed the way, but only through the necessary action being taken when required, and the whole-hearted cooperation of the personnel in manufacturing research, production, industrial engineering, maintenance and laboratories with the analysts and inspectors, were these improvements possible.

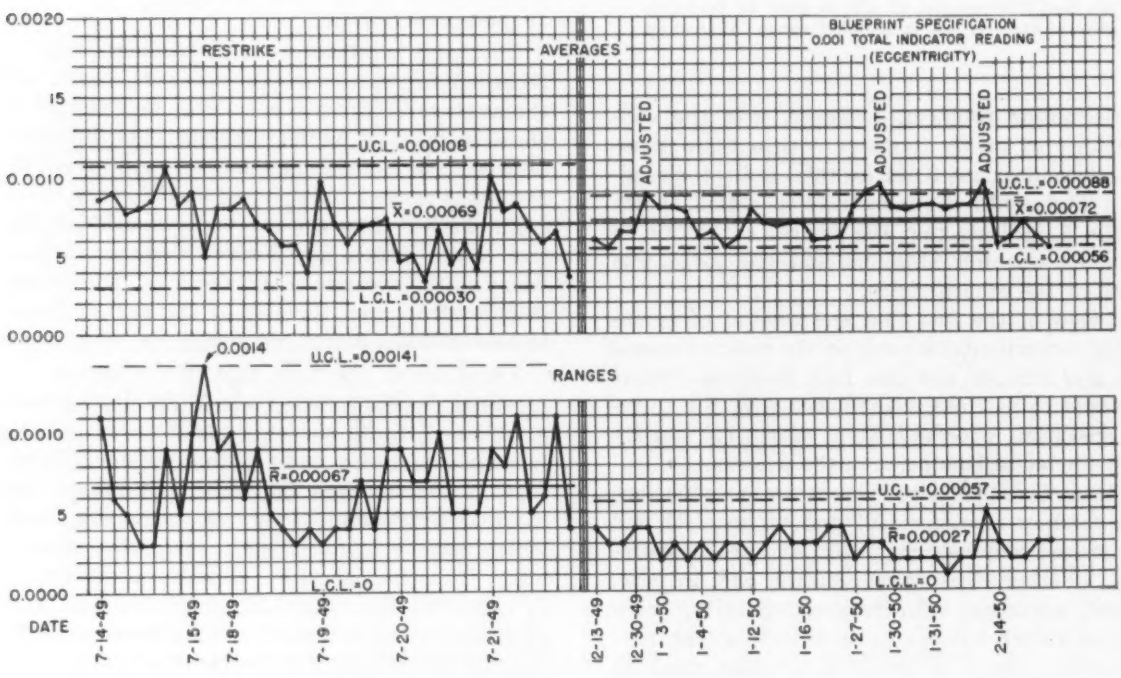


FIG. 7—The statistical control chart of average and range of sizes after restriking in quality control of bushings at Ford.

Powder Parts | MACHINED and PLATED

Unlike most applications, this metal powder part is extensively machined. Successful plating, long a bug-a-boo to the industry, is also solved by improving the conductivity and decreasing the porosity of the part. These lock parts cannot be made economically by any other method.

By PAUL K. SCOTT
Plant Manager, Illinois Lock Co., Chicago

POWDER metallurgy is normally utilized to reduce the number of machining operations required on mass-produced parts. It is unusual to employ powder metallurgy to produce a blank on which several machining and finishing operations must be performed, especially where the finished product must have a durable plated finish. However, in connection with the design and production of a lock for a new type of parking meter, it was found that the best solution to some of the problems involved was the use of such a powdered metal blank. Once the difficulties connected with machining and plating such a blank were solved, the powdered metal part proved to be highly satisfactory for efficient and economical production of the special lock.

A parking meter manufacturer wanted a high quality lock to complete the development of a newly designed meter. As the product might be sold and installed anywhere, the lock would have to be capable of retaining trouble-free operation and attractive appearance under all types of adverse weather conditions.

Besides the salt air of coastal cities, the lock must resist the saline deposit encountered in northern cities, that results from the chemicals used for street ice removal. These chemicals vaporize under heavy traffic on warm days. The lock must operate freely and look good despite such corrosive conditions. It must be capable of operation despite the freezing of water vapor inside the mechanism, and it must be virtually pick-proof.

The Duo lock mechanism shown in Fig. 1 is made entirely of brass and chromium plated, and meets all the specifications. But the unusual locking feature required for this meter meant adapting the mechanism to a special design which did not lend itself to conventional methods of manufacture. The meter design left no room inside the meter case for the usual cam locking mechanism. Instead, locking is accomplished by means of the flanged head of the lock plug. The round head fits into a recess in the upper half of the meter case so as to prevent its turning. Part of the head is recessed, so that when the lock is turned, the head will no longer interfere with the turning of the meter top. The top can

then be removed by unscrewing it from the lower half.

The lock plug required is of cylindrical shape, with an almost flat head of larger diameter at one end. The key is inserted axially and the slot is of intricate shape. For security and for positive operation, the lock has tumbler-operating serrations cut on three surfaces. This keyway extends entirely through the length of the plug. A rectangular hole is broached through the body of the plug to accommodate the tumbler and spring assembly. The sides of this hole have spline grooves into which the tumblers fit. The splines serve as gibs for tracking each set of tumblers. Expansion action of the tumblers prevents turning of the plug in the lock barrel when in the locked condition.

Standard lock plugs are prefabricated components made from screw machine blanks with the head produced separately and swaged onto the blank. But a swaged head would not retain its strength after part of it was cut away, so this method of construction is not satisfactory for the parking meter lock. The idea of making the entire blank-head as a one-piece screw machine product was abandoned because of the obvious difficulty of forming the intricate keyway through the axial length of the part. Diecasting was not applicable in this case because of the durability and operability requirements. Other conventional manufacturing methods were considered but were found to require too much in the way of extensive and costly tooling. Powder metallurgy offered the only practical solution in this case. Plug blanks of brass powder are compacted and then coined. Due to the intricate shape of the part, it is impractical to coin the part to its final shape and dimensions. Too many delicate and costly cores would be required. The as received plug blank is of cylindrical shape with a completely circular head. Only the keyway is already formed by cores in the coining process. The operations remaining to be performed include milling, turning, drilling, broaching and piercing, all of which are accomplished with ordinary methods on standard equipment, although some special tooling is required.

The first operation, turning a ring groove near the end of the plug, is straightforward. It is performed on an ordinary bench lathe fitted with a special collet shaped to accommodate the head of the plug. But the operations of drilling and broaching caused a great deal of trouble at first due to the tearing away of the metal at the edges of the bottom of the hole. In early development work, the scrap rate ran as high as 50 pct due to this difficulty. The difficulty has been eliminated both by improving the machining qualities of the coined blank and by altering the machining methods. Increasing the strength of the material

FIG. 1—The blank as received from the vender is shown at the upper right. The center blank has been drilled and the groove turned, the finish machined part, at the left, before plating. At the bottom is the final assembled lock showing tumblers inserted and the blind hole pierced to accommodate the shoulder pin.

on the one hand, and reducing the tooth load so that strength requirements would not be so high on the other, solved the problem.

Recoining of the blank was considered too expensive. It was found that by increasing the sintering time improved machining characteristics could be obtained. Sintering for 45 min at 1600° F gives the best results. This is about 10 min over what is usually considered normal. In addition, special drills and broaches were de-

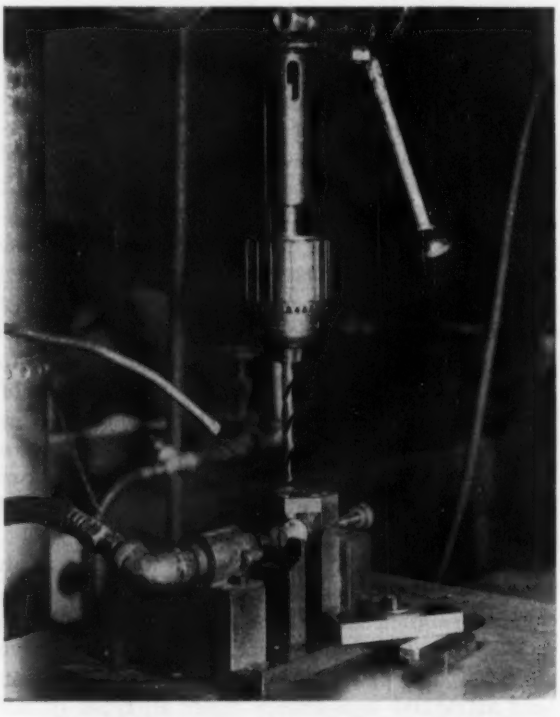


FIG. 2—Inasmuch as side cores are impossible, the parts are drilled and this hole later enlarged in broaching to accommodate the tumblers.

TABLE I

How to Plate Powder Parts

1. Solvent oil clean
2. Light polish and buff
3. Rack for tanks
4. Alkali cleaning
5. Cold water rinse
6. Acid dip
7. Cold water rinse
8. Acid copper bath
9. Cold water rinse
10. Hot water rinse
11. Dried in sawdust, removed from rack
12. Light buff
13. Rack
14. Alkali cleaning
15. Cold water rinse
16. Acid dip
17. Cold water rinse
18. Bright nickel bath
19. Cold water rinse
20. Chrome bath
21. Cold water rinse, two tanks
22. Hot water rinse
23. Dry, remove from rack
24. Color
25. Ready for assembly

signed to minimize the tearing action on the metal.

The next operation after turning the groove is to drill a 5/16 in. locating hole in the body of the blank, done on an ordinary drill press, Fig. 2, with a four-step drill. The final step removes very little metal. Here the hole is cleaned up and the chipped exit edge of the hole left by the previous step is removed. In the third machining step, this hole is then enlarged to a rectangle 5/16 x 9/16 in. by broaching in two operations. The finish broach, Fig. 3, not only brings the hole to size, but cuts the delicate splines in each side wall.

Normally, a broach for such an operation might have about three or four finishing teeth. The broach used has eight finishing teeth, each of which removes less than half a thousandth of metal. The stress which tends to break away the metal on the exit edge of the hole is thereby cut to a negligible minimum.

The next machining operation is to mill a recess across part of the circumference of the head to permit unlocking. This is a conventional side-milling operation. The final operation consists of piercing a ⅛ x 1/16 in. blind hole for a shoulder pin near the bottom of the blank. By inserting proper support in the keyway to prevent collapse under the impact of piercing, this operation is done without difficulty. Only a very slight depression results on the surface of the blank around the hole.

Plating Techniques

Standard brass locks made by Illinois Lock Co. are protected against corrosion by chromium plating. It is essential that the parking meter locks be so protected because of the high degree of appearance and operability required under adverse conditions. There was very little actual production information available concerning the application of chrome on powdered brass, and it was only after considerable experimenting that it became possible to produce a plating of a quality which would meet specifications.

The porosity of powdered metal is the main source of difficulties encountered in plating. Methods of reducing the porosity such as impregnation, recoining, and hand or mechanical burnishing are impractical from a cost standpoint. Successful plating is now done by a cycle which eliminates the two types of trouble caused by porosity.

One of the troubles caused by porosity is the retention of oil and acid in the pores, requiring extremely thorough cleaning methods for removal. An improperly cleaned part may take a good finish, but attack on the coating from underneath begins immediately, and it soon flakes off. The most serious difficulty, however, is the low conductivity of the porous metal, which makes it difficult to obtain uniform distribution and ad-

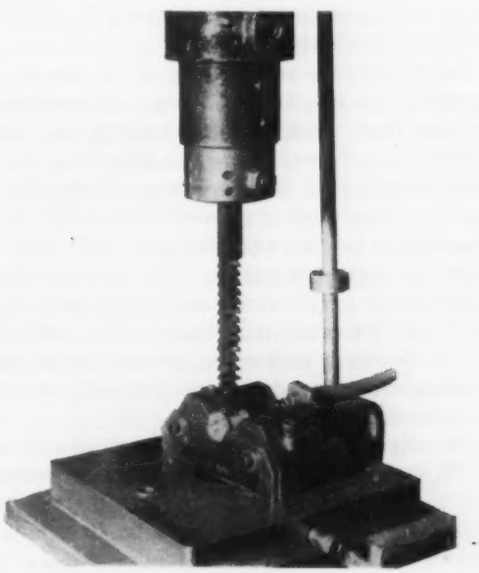


FIG. 3—Broaching is done with a special broach after the lock part has been drilled.

hesion of the nickel and chrome coatings. Development work done at Illinois Lock Co. has eliminated these two difficulties and resulted in a cycle including a base coat of copper, and a variety of cleaning steps, all very carefully performed. The complete sequence is shown in Table I.

The cycle begins with a thorough solvent cleaning to remove oil. This is followed by a light polish and buffing operation. It is extremely important to avoid removing too much metal during this operation, since breaking through the thin skin of the part exposes the more porous material underneath and lessens the possibility of obtaining a high finish. After buffing, the parts are sent through an alkali cleaning solution, rinses, acid dip, and final rinse.

The parts are next placed in an ordinary acid copper plating bath, to acquire the copper coating. This step is the answer to obtaining sufficient conductivity for successful nickel and chromium plating. The parts are in the bath for about 25 min and build up the coating to a minimum of 0.0003 in. Some published recommendations for plating on powdered brass suggest a coating of 0.001 in. of copper, but this is too heavy a deposit on a precision part. In the case of this part a coating 0.0003 in. thick is sufficient.

Following the copper coating, the subsequent operations are more or less a normal routine. The parts are rinsed, dried, and buffed, then go through an alkali cleaning bath, rinse, acid dip, and another rinse. The next step takes about 12 min in a bright nickel bath, to build up a coating of 0.0005 in. minimum thickness. An ordinary high-current-density bath is used. After rinsing, the parts go to a chrome bath for 4 min where a minimum coating of 0.0001 in. is applied. Rinses and coloring complete the cycle.

Throughout the cycle, the bath compositions, temperatures and current densities are those in common use for plating on brass. However the optimum thickness of the copper coat, the nature and extent of the cleaning operations, and the sequence of events in the plating cycle, all were determined only after lengthy experiments. With proper care in buffing, thorough cleaning, and the building up of conductivity through the copper coating, a top grade finish with exceptional durability was obtained which has been proven both in the laboratory and in the field. The finished coating has withstood 76 hr of a standard salt spray test, and installations have been in service in various parts of the country for as long as 2 years, with no complaints reported.

An Improved Magnesium Alloy

AN improved magnesium extrusion alloy designated ZK60, containing 6 pct Zn and 0.6 pct Zn, has shown increased toughness, relative insensitivity to notch effect, and good impact toughness and fatigue strength, according to Dow Chemical Co.

Early experimental work in Germany and England on magnesium alloys containing zirconium had been devoted mainly to casting alloys. Investigation at Dow Chemical Co. has been directed at developing a commercial extrusion alloy with improved properties. It was discovered in this experimental work that the high strength properties are due mainly to small grain size, insured and maintained by the addition of zirconium. Other factors contributing to strength properties are extrusion conditions, such as speed, temperature and reduction of cross-sectional area.

Tensile yield and compressive yield strengths of ZK60 are substantially the same, whereas in other wrought magnesium alloys the compressive yield is normally only 60 to 70 pct of the tensile yield strength.

One application is the use of ZK60 for the floor beams in the Douglas DC-6 airplane. A number of factors dictated the use of magnesium for this purpose. From early investigation it appeared that beams built up from formed sheet of any other metal would be unnecessarily heavy because of the excess material needed at the joints. Extrusions of other light metals, on the other hand, were too heavy because extrusion limitations prevented making a web sufficiently thin for structural efficiency. Magnesium extrusions with a bulkier section made possible an efficient and more rigid design with a weight saving of 5 pct and a cost saving of 25 pct.

These floor beams have been in service for the life of the DC-6 airplanes with no complaint of any kind. Further evidence of success is the fact the recently built C-124 uses about 1000 lb of 8, 10, and 11-in. ZK60 I-beams in its design.

Other applications include the ZK60 spar cap in experimental magnesium F-80 wings built by East Coast Aeronautics, Inc., and the use of the alloy in the last fifteen sets of SNJ and AT-6 wings produced under military contract at Dow's magnesium fabricating plant in Bay City, Mich.

Oil Cavity Increases Self Lubrication

For the first time powder parts are now being made with interior cavities which serve as oil reservoirs. The oil pockets prolong the self-lubricating properties of powder bearings by 500 to 600 pct.

By **WALTER G. PATTON**
Detroit Editor
THE IRON AGE

POWDER parts because of their porosity lend themselves to impregnation with oil. Since their inception many such applications have been used particularly in bearings. Just recently one manufacturer has gone even further. This company has perfected a method of making an oil reservoir inside the powder parts which increases the oil content of the piece five to six times over the usual amount.

Any discussion of recent powder metallurgy developments would be incomplete without reference to these unusual products recently introduced by Michigan Powdered Metal Products Co., Northville, Mich. These sintered metal parts have a cavity of uniform size and shape inside the wall. The opening can, if desired, be varied over a considerable range of sizes and shapes. It can be filled with oil of a type that particularly meets the needs of the application.

Such parts have been used with good success for bearings required to carry heavy loads and for self-lubricating gears. Patents on the new process have been applied for but details are not available. These are believed to be the only powdered metal parts being produced in the country today of this type.

The bearings being supplied by Michigan Powdered Metal Products Co., are of three types: The Pocket type, shown in Fig. 1, has an opening that is rectangular in shape. This type is adaptable for oil well bearings or for thrust bearings. A second type, shown in Fig. 2, has a pocket filled with sponge iron which provides a capillary action effect that tends to retain oil for long periods of time. This type is recommended for applications where heat is a factor limiting ordinary bearing life. The third type, shown in Fig. 3, is recommended for applications where wall strength is important. The small holes permit extra lubrication without sacrificing strength.

So far, bearings up to 3 in. OD have been produced and the present limitation on size is press capacity.

Haller* oil well bearings are reported to withstand much heavier loads than conventional sin-

**John Haller, inventor of the process.*

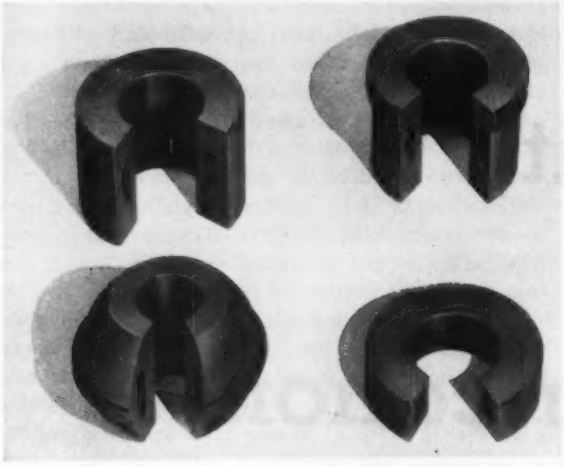


FIG. 1—Cutaway views of powder parts containing the oil reservoirs which are formed in compacting.

FIG. 2—In these parts the oil reservoirs are packed with absorbant sponge iron in order to retain self-lubricating properties for extended periods.

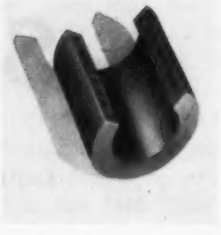


FIG. 3—Where wall strength will not permit large single cavities numerous small holes form the oil reservoir.

tered bronze or iron bearings. Service tests show these bearings are well suited for pillow blocks, enclosed motors and for large diameter shafts. Their nonfreezing characteristics make them particularly adaptable for guide pin bushings.

Such bearings may be surface hardened by either carburizing or cyaniding. A part—consisting of a plunger and/or ball for a valve—can be buried inside the part if desired and clearances can be held within reasonable limits.

Because of the large internal opening available in these parts some consideration has been given to water cooling such bearings. Another suggested application is for temporary water-cooled molds that cannot be vented properly when solid metal is employed. Self-lubricated nuts have also been suggested. Development of these three parts is in the early development stage and such parts are not being made commercially at the present time.

As indicated in Fig. 4, Michigan Powdered Metal Products Co. has complete facilities for the contract manufacture of powdered metal parts that must be held to close tolerances. The company has complete research and production facilities. Much of its equipment, including all dies, are designed and built in its own shop and the company has a completely equipped heat-treat department.

FIG. 4—Typical powder metal parts made by Michigan Powder Metal Products Co.

Powder Helical Gears

They Said It Couldn't Be Done

Helical gears require much more intricate dies and punches than do standard parts. One of the big problems was to eject gears from the dies. The parts are now automatically spun out of the die.

By ANDREW J. WAYSON, *Manager, Powdered Metal Div., and Donald B. Leavitt, Tool Design Engineer*
Merriman Bros., Inc., Boston

GEARS have been one of the most popular powder metal products. Not until recently, however, have helical gears been produced in quantity. Prior to 1947 helical gears were thought to be impossible by powder metallurgy methods. Since that time, however, Merriman Bros., Boston, have produced about 3 million such gears on automatic presses at production rates as high as 28 gears per min.

Between the first attempt and the eventual successful production there were many troubles. In the first place the trade was so convinced the job couldn't be done that there was no demand for powder helical gears. Finally, after the first order was delivered many customers and powder fabricators wouldn't accept the facts. The first public exhibit of the types of gears shown in Fig. 1 occurred at the Chicago Powdered Metal Exhibit in 1948. The reaction of some experts was "Who are they kidding?"

Helical gears offered manufacturing difficulties above and beyond those of pure powder metallurgy. In the first place the design of tooth contour, shape and smoothness had to provide a

quietness in operation comparable to ordinary helical gears.

Because the compacting pressure is only exerted in two directions, the strength and porosity of the teeth of the gears were questionable. It was quickly discovered at Merriman that a limit on the helix angle of the teeth existed. Over a certain angle, sufficient top and bottom pressures could not be had to insure quality of the teeth around the periphery of the gear.

The gears shown in Fig. 1 have a range of helix angle from 10° to 27°. This, so far, is the practicable range of the helix angle that Merriman has been able to make satisfactorily. Another problem was in ejecting the part from the die. The first made stripped the teeth from the die when ejected.

Today the parts are spun out of the die by synchronizing motions between the rotating punches and dies. The density of the helical gears is the same as that of regular parts for similar applications.

Press setups have to be very exact as there is more danger of damaging punches and dies than in the usual part setup. To date helical gears have not been coined or sized. Die prices to make the types and sizes of gears shown here average about $700 per set, depending on the height or thickness of the finished part.

Prices vary with quantity, alloy or type of powder specified and the heat treatment required. Helical gears cost from 1¢ per gear for plain iron about ⅜ in. diam, to 14¢ for an alloy gear, 1½ in. diam x ⅝ in. high, case hardened.

The powdered metal helical gears produced by Merriman have been used extensively in the past 3 years and have proved to be every bit as satisfactory as gears hobbed in the usual way. In many cases the powdered parts are preferred due to their self-lubricating properties, when oil impregnated, and their dampening characteristics.

Applications have been in household mixers, toy trains, instruments, clutches and other small equipment. The majority of these gears have been produced of iron or iron alloy, but some have also been made of brass and bronze. It is much easier to hold tolerances on helical gears produced from iron or iron alloys than from some of the other metals. These powdered gears offer savings ranging from 80 to 400 pct and here again quantity, material, tolerances, etc., enter into final cost and are the factors which finally determine what type of gears should be specified. Helical gears, just like most other powder metal machine parts, are put into service as-is without further finishing or machining operations. Tolerances on the helical gears produced at Merriman can be held to a total of 0.002 in. on the outside diameter of smaller gears, 0.003 in. on larger gears and a total of 0.004 in. on larger case-hardened gears. Tolerances on the inside diameter of a total of 0.001 in. total are currently being produced.

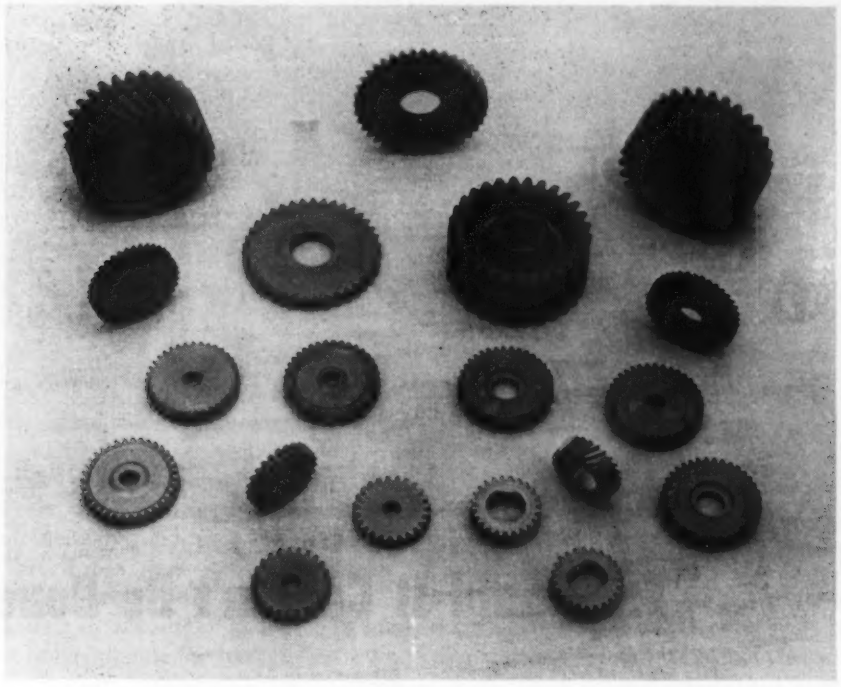


FIG. 1—Powder gears containing helix angles from 10° to 27°. The largest parts are about 1½ in. in diam.

FIG. 2—Above, latest wrinkle in helical gears is the combination of a left and right helix gear pinned together to make a herringbone. The two parts are drilled and pinned in a jig to assure tooth alignment. Bosses can be formed, over the height of the gear itself, if this height is limited to 3/32 in. The boss must also have a slight outside taper.

How GE Buys POWDER PARTS

By J. D. CAREY
Metallurgical Engineer, Works Laboratory, and

A. G. PISON
Quality Control Engineer, Home Laundry Equipment Div., General Electric Co., Bridgeport, Conn.

Special test procedures are needed in maintaining quality in powder parts purchased from vendors. Accelerated tests are used to predict actual performance. Statistical quality control checks on mechanical properties are employed on vendors' shipments.

NEW powders have been developed which have superior physical properties, thus continually opening new fields for powder metal applications. The General Electric Co. has recognized the advantages of using powdered metal parts and has incorporated them in the manufacture of appliances. The two types of parts primarily used are structural parts and bearings. Both require special test procedures for approving their use and maintaining uniformity.

A definite procedure has been established by the Home Laundry Equipment Division of the General Electric Co. for approving the use of a powdered metal part. Since the properties of powdered metal parts vary with the dimensions, it is necessary to know how a particular part will stand up before it is accepted for use.

The vendor furnishes sample slugs of the material, Fig. 1 is typical, to be tested, unless he has tools which will produce a part having the desired dimensions. These sample slugs or parts have the physical properties which the engineer-

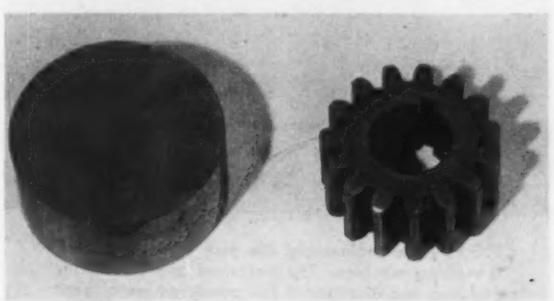


FIG. 1—A sintered iron gear and a slug from which it was machined.

ing department and vendor have agreed upon for the initial tests. If slugs are supplied, they are machined into finished parts for testing.

Several are checked for physical properties including hardness, density, breaking strength and

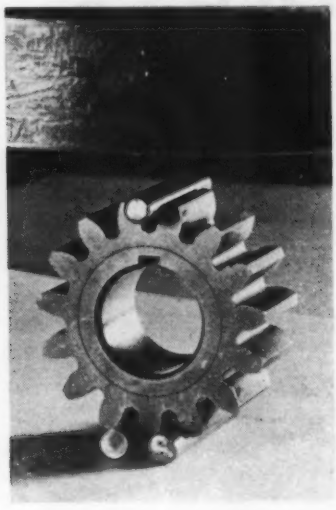


FIG. 2—The three-pin method of testing tooth strength. This test is conducted on parts before a special test fixture is made.

chemical composition, as in Fig. 2. The balance are subjected to an accelerated life test in regular production appliances picked at random, Fig. 3. At the completion of the life test, the parts are carefully inspected and any wear, dimensional change, or imperfection is noted.

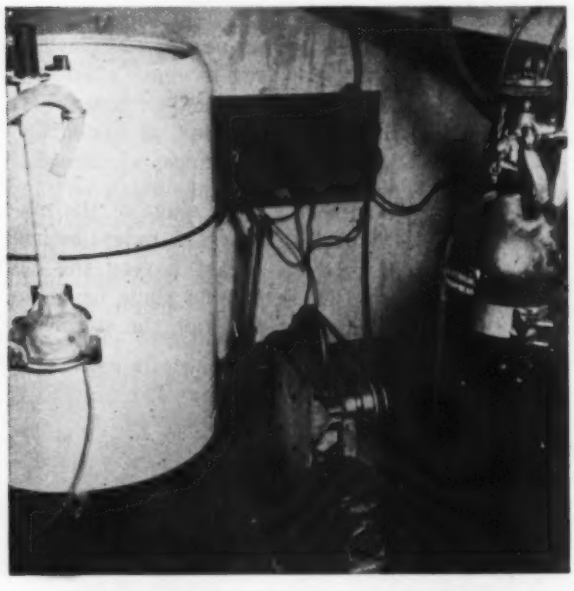


FIG. 3—An engineering life test in operation on a washing machine. The motorized unit continually engages and disengages the powdered metal gear with the driving rack. The tested part is repeatedly loaded in impact under actual operating conditions.

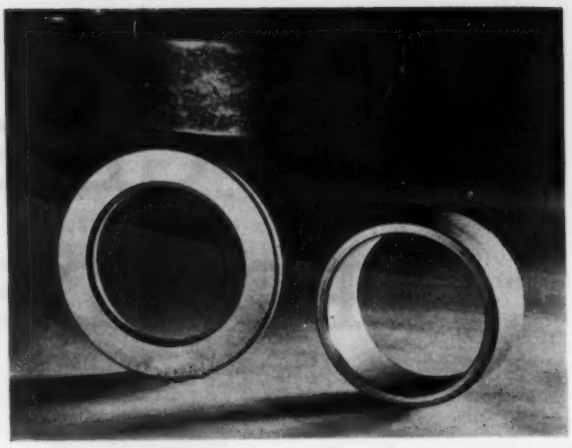


FIG. 4—Method of testing flanged bearings according to the ASTM procedure. In this test the flange and sleeve are tested as separate parts.

Test results are discussed with the quality control section, metallurgical laboratory, and engineering dept. If the parts are satisfactory, the producer is then placed on an approved list in the purchasing dept., permitting him to furnish these parts.

When the producer has completed his tooling, parts are submitted for approval. These parts are carefully checked for all dimensions. Additional parts are given the same physical property test as given those machined from slugs. In the event parts, such as bearings, are pressed into housings, the dimensions are again checked after pressing.

If the sample parts are satisfactory, the supplier is informed that certain specifications pertaining to physical properties will be required for regular production run parts. These require-

TABLE I

Certification of Quality

Specification	No. Checked	Results		Remarks
Min. Radial Crushing Strength	10	840	780	
		800	660	
		780	780	Average 762
Sleeve (400)		740	800	
		740	700	
Flange: (200)	10	250	240	
		250	264	
		246	242	Average 248
		242	246	
		252	250	
Weight, grams: (53.5-55.5)	10	55.4	55.2	
		55.5	55.6	
		55.5	55.3	Average 55.5
		55.7	55.7	
		55.4	55.6	
Hardness: R/15T (58-78)	10	63	59	
		61	66	
		62	59	Average 60.7
		62	59	
		58	58	

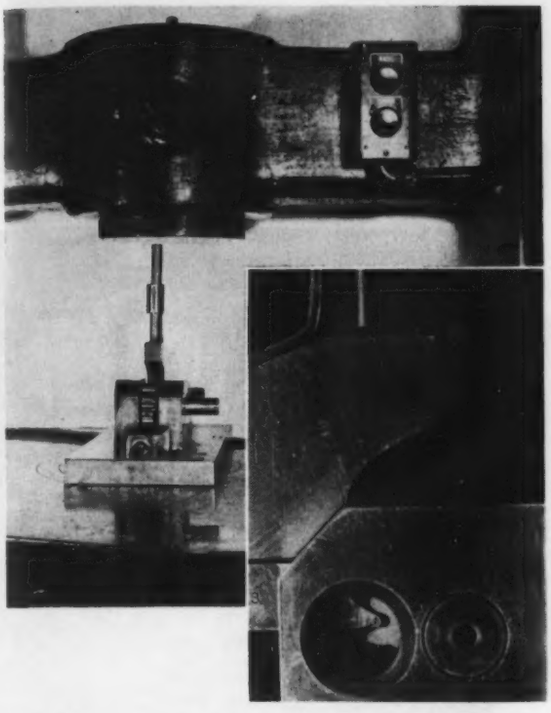


FIG. 5—A tooth shear test using a special testing fixture for a powdered iron gear. The load applied by the testing machine is transmitted to the gear as shown in closeup at right.

ments are based on the known physical properties of samples which have proved, by actual destructive or life test, to be satisfactory.

These requirements include such properties as: Tooth shear strength, radial crushing strength, weight (or density), hardness, and chemical composition. Bearing tests are generally conducted according to ASTM procedures shown in Fig. 4. Tests on structural parts are governed by actual operating requirements. All of the foregoing requirements or specifications are issued in the form of an engineering instruction, which is referred to on the part drawing.

When all requirements have been established

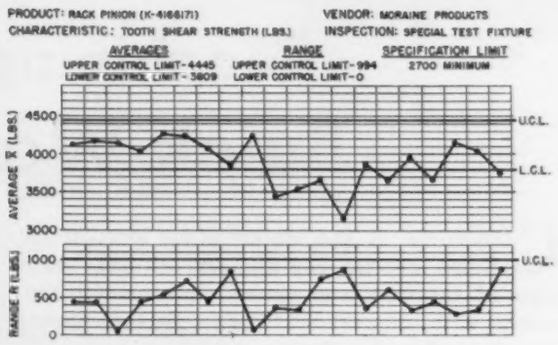


FIG. 6—A quality control chart (X and R) plotting the values obtained from laboratory tests using the special tooth testing fixture shown in Fig. 5. This chart detects trends in the vendors' process.

for a part, a quality control inspection plan is instituted which outlines and covers the critical and major dimensions and lists physical test requirements. This plan establishes the AQL, or acceptable quality level, for each critical or major dimension. The vendor may also have to submit certification of his test results covering specific physical properties for each shipment of parts.

When shipments are received, random samples from each lot are submited to the laboratory for physical and chemical testing. The results of mechanical tests, like the check on tooth strength in Fig. 5, are plotted on quality control charts to detect trends or changes in the process which, if continued, might cause failure and subsequent field complaints. A typical control chart work sheet is reproduced in Fig. 6.

When such changes are noted, the supplier is immediately notified to check his process and take what action is necessary to bring the process within control. Incoming lots are accepted on the basis of the quality control inspection plan, the vendors certification of physical properties, and the results of laboratory tests. All these checks are listed on standard forms similar to that shown in Table I.

Powder Magnets Replace Latch

Midnight snackers can now raid the icebox without fear of the giveaway click of the latch. Small but powerful 1-in. permanent Alnico magnets are used by General Electric Co. in their new magnetic refrigerator door-closing device. As the door moves to within a few inches of the cabinet the magnets pull it tight quickly and silently. Hundreds of magnets, made from powdered metal, line the door gasket area and the closing force is easily broken by moderate hand pressure when opening the box.

Machining Buick Water Pumps

CHANGES in the water pump location on Buick Special engines necessitated redesign of the cast iron elbows that connect the pumps with the cylinder blocks. As redesigned, the elbow has two flanges, the faces of which are at right angles to each other. By providing new machining facilities for this job, it has been found easy to machine the part so that the flange faces are accurately positioned and holes are drilled, tapped and chamfered during the single machine setup.

The machine procured is a special six-station, W. F. and John Barnes milling and drilling machine, the central table of which is shown, with fixtures and several tools, in figs. 1 and 2. Spaced around this circular indexing table, on extensions of its base, is a series of units having spindles that drive the milling cutters that face both flanges and the tools that drill, chamfer and tap holes in the flanges.

The table is indexed through five working and one loading stations in completing a machining cycle. All cuts are made with the work fixed after indexing. Loading is done at the front station, shown in Fig. 1, in one of six duplicate fixtures. The casting is cam locked by a vertical pin that operates a horizontal lever pivoted at its center. Side pins are advanced to insure correct location, which is from a bottom and two side pads. These pins operate by a screw whose outer end is squared to receive a power driven socket wrench that slides on a spline. The wrench turns in a fixed support and is withdrawn after locking the fixture and before the table indexes to the first work station.

Each fixture contains pilot pin holes that engage with pins advanced from each working head to insure alignment with the respective working heads before cutting starts. At the first working station, the top flange which is the water pump face, is milled by a cutter that feeds down vertically to make its cut. After indexing to the second station another cutter mills the vertical flange or crankcase face by moving in horizontally. Both cutters have inserted carbide tipped blades and can be seen in the right of Fig. 2.

At the third station a pair of drills fed downward produce two holes in the water pump face, and these holes are chamfered at the fourth station. These holes are tapped at the fifth station, where, simultaneously, combination drill and chamfer tools are fed in from the side to produce and chamfer two holes in the crankcase face. These holes are not tapped. Unloading and reloading take place after the work has been indexed from the fifth station to the loading station.

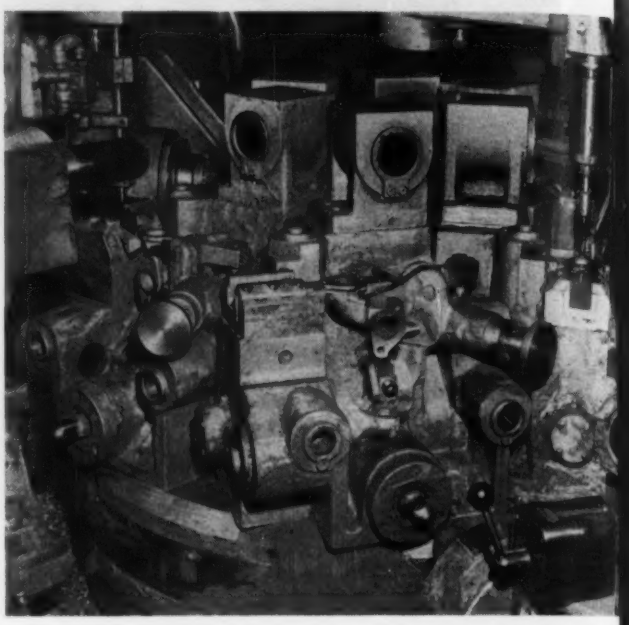


FIG. 1—Setup for elbow flange machining as it appears from the loading station. The hand lever in foreground is for operating the wrench that engages the fixture locking screw.

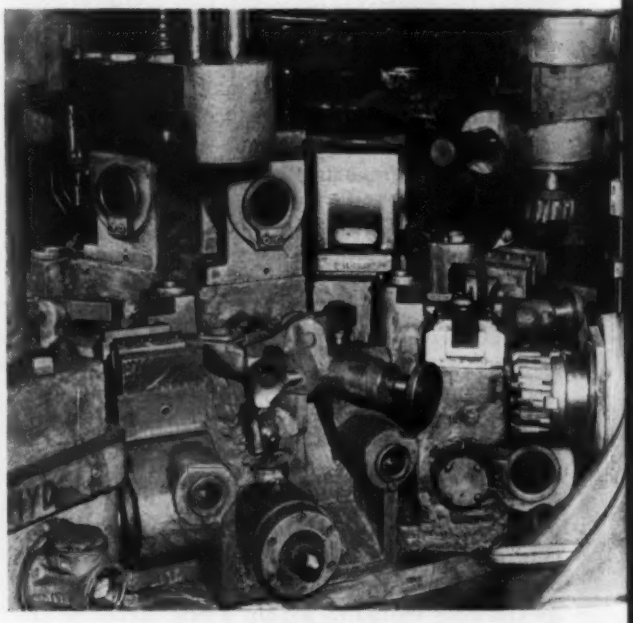


FIG. 2—Rear view of the setup showing, at right, the carbide-tipped inserted blade cutters that face the two flanges. Tapping of top flange holes is done in station at extreme left.

New TINPLATE COATING THICKNESS Meter

Control cabinet of the continuously tinplate coating thickness meter.

MORE uniformly coated electrolytic tinplate is obtained by using an instrument developed at the research laboratory of Carnegie-Illinois Steel Corp. This meter, which continuously indicates and records tin coating thickness on steel strip during the plating operation, is now in regular use on all Ferrostan electrolytic tinning lines of United States Steel.

The coating thickness meter operates entirely independently of other control instruments on the lines. Its function is to combine the electrical values of plating current, strip speed, strip width and plating efficiency in a precision circuit employing a self-balancing potentiometer to indicate and record thickness. For the convenience of the operator the instrument is calibrated in pounds per base box.

Since the instrument provides a continuous indication of coating weight, any variation in plating thickness is indicated at once. Provision can be made for the instrument to operate an alarm when the coating weight deviates from the specified value. Also, if desired, the equipment may be set readily to control coating weight.

Reference potentials which actuate the meter are received from a tachometer generator, whose electrical output is directly proportional to the strip speed, and from a shunt or the equivalent in the plating-current bus, which provides a potential directly proportional to the total plating current. Thus potentials that are always proportional to strip speed and total plating current, respectively, are supplied to the meter continuously.

Since the quantity of tin deposited per unit area on the strip is a function of plating-current density, plating time and the efficiency of the plating bath, provisions were made to compensate for variations in these factors. The strip-width compensating potentiometer is calibrated to cover material 18 to 34 in. wide.

Following installation and calibration of the original plating thickness meter, approximately 80 tests were made over a 10-day period of normal operation. These tests covered electrolytic tinplate production ranging from 0.25 to 0.75 lb per base box. In each test, chemical determinations of coating weight were compared with indications on the plating thickness meter. The meter was found to indicate coating weights as accurately as the chemical method.

Application for patent on the meter has been filed.

AUTOMATIC AIR PUSHOUTS

EJECTION or large stampings from draw dies is automatic on several double-acting Clearing presses in use at Studebaker Corp.'s new stamping plant at South Bend, Ind. The presses are not equipped with air cushions such as are frequently used to operate ejectors. Instead, air cylinders are applied to the lower half of large draw dies and plungers are connected so that the drawn shapes are automatically lifted free of the dies as the press ram makes its up-stroke.

To control the air plunger, an air valve is located on the outside of the press frame and connected to a lever arranged to be moved by a rod that is reciprocated vertically in guides as the press ram rises and falls, as shown in the accompanying illustration. On the rod are collars that contact one end of the valve lever to move it up and down for opening and closing.

To avoid shock, the collars are backed by compression springs bearing against adjustable collars fastened to the rod by set screws. One pair of collars is set so that as the press ram and rod move upward after a part has been drawn in the die, the upper collar of the lower pair contacts the valve lever and, as the spring is compressed, opens the air valve. This admits air to an ejector cylinder and the ejector pins are elevated. Two such pins are shown in raised position in the die.

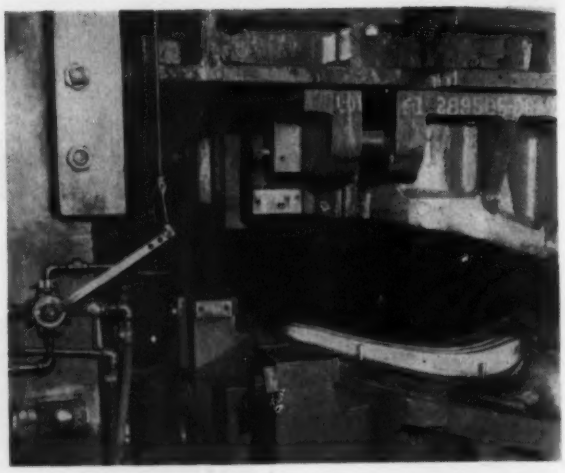


FIG. 1—The plungers in the die automatically eject drawn parts on the upstroke of the press ram. The operation of these plungers is controlled by the rod and air valve arrangement on the side of the press housing.

After the drawn piece has been removed and a new blank inserted in the die, the operator starts the press. As the ram moves downward, the rod with its collars also moves downward until the lower collar of the upper pair moves the lever enough to open the ejector cylinder exhaust. This causes the air plunger to retract and pull the pushout pins back so that they clear the piece as it is drawn. The valve cycle repeats automatically with each press cycle.

The press operator does not have to touch the air valve or do any ejecting. He need only unload and reload the press.

Technique for Smog Analysis

AN investigation to determine the nature of the particulate and gaseous impurities of smog and the reasons for their behavior has been conducted by P. L. Magill, Stanford Research Institute and was described in a paper presented at the recent first national air pollution symposium at Pasadena, Calif.

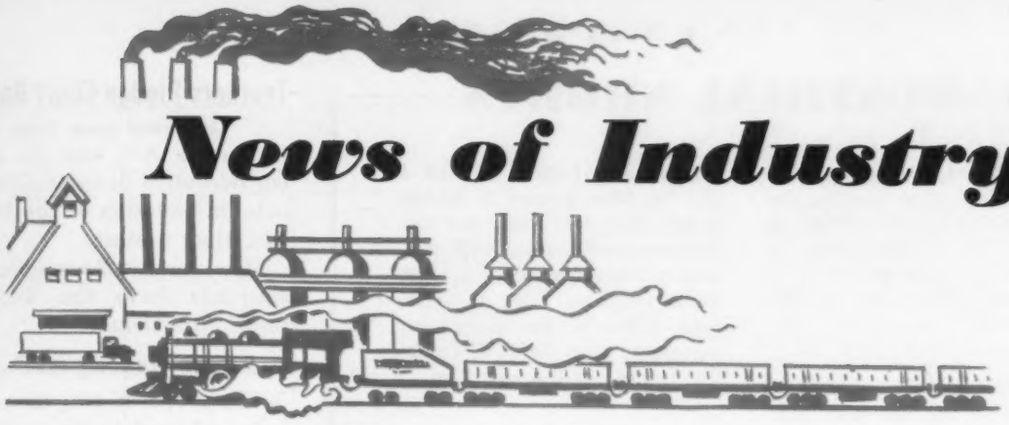
Electrostatic and thermal precipitation, high velocity impaction, and prolonged sedimentation methods were used to collect the particulate matter. Optical and electron microscope techniques were employed to count and measure the number and sizes of the particles. Verification of results was obtained by photographing the smog particles in space.

A photographic method of measuring the attenuation coefficient of the smoggy atmosphere provided an instrumental method for determining visibility, and demonstrated that the particulate matter collected and analyzed by other methods could account for the visibility subjectively observed. Microchemical and spectroscopic methods and the newly-developed proton bombardment method were used to determine the chemical composition of the particulate matter.

The gaseous impurities in the atmosphere were collected by adsorption techniques and by freezing with liquid nitrogen. Some of the gaseous impurities were determined by polargraphic methods and by sensitive color reactions. Approximately 45 elements and compounds have been identified in the Los Angeles atmosphere.

The haze-forming property of hygroscopic smog particles was measured quantitatively in the laboratory by using an adaptation of the Bradbury transmissometer as well as a modification of the Wilson cloud chamber.

A smog chamber in which people were exposed to the same concentration of impurities found in the Los Angeles atmosphere showed that a combination of particulate matter and gaseous impurities can cause eye irritation similar to that observed in the city, even though no single material was present in sufficient quantity to cause eye irritation by itself.



News of Industry

Truckers Pledge Rail Rates Court Battle

Eastern railroads maneuver to regain lost steel freight trade with lower carload rate proposal to ICC . . . Highway haulers protest existence threatened—*By JOHN DELANEY*

Pittsburgh—Truckers will muster all the might of their legal staffs for courtroom battle if the Interstate Commerce Commission nods in favor of reduced 80,000-lb carload rates on iron and steel railroad shipments. The ICC verdict on the Eastern roads' stratagem to recapture iron and steel freight business lost to highway carriers is pending.

Oral Hearing Held

A legal fight was promised if the measure is approved at a recent Chicago meeting of the Assn. of Iron and Steel Haulers, an organization of trucking companies. It was also decided to protest the railroads' proposal before the Commission.

At the request of the railroads, the ICC scheduled an oral hearing for Apr. 18 on a motion to permit the rails to put the lower rates into effect on 10 days' notice. The tariffs were filed to become effective May 1.

ICC Has 3 Choices

The railroads' proposal is frankly a move to recapture iron and steel freight business lost to highway carriers. A special study by the railroads during the week of Dec. 12-18, 1949 showed that of all manufactured iron and steel articles, the trucks were handling 52.2 pct and the rails 47.8 pct. Trucks hauled 72.5 pct of the sheet and strip tonnage; 58.9 pct of the tinplate tonnage; 53.1 pct of the bar tonnage and 50.5 pct of the wire and wire products. The railroads found that some iron and steel producers were shipping by truck as much as 80 to 90 pct of the commodities which would be subject to the reduced rates.

Traffic authorities say the ICC may do one of three things with respect to the railroads' proposal: (1) approve the rates and deny the truckers' protest; (2) decide that there is sufficient evidence that the rates are not satisfactory, suspend them and investigate; (3) allow the rates to go into effect, but investigate further.

The truckers object that the proposed rail rates will put them out of business. They are not compensatory, are in violation of the

Turn to Page 104

Rail vs. Truck Rates
(In cents per 100 lb.)

From Pittsburgh to	RAIL		TRUCK	
	Existing	Proposed for 80,000 lb. carload shpmnts	Existing	Proposed
Detroit	51	35	40	46
Chicago	63	51	48	55
Buffalo	44	30.5	31 to 35	40
Cleveland	34	22	26	31
Columbus	40	27	30	36
Toledo	44	30.5	35	40

Inland to Blow in Another

Chicago—Blast furnace No. 4 will be blown in by the Inland Steel Co. in the first week of May to bring the total of furnaces operating to seven. No. 4 will be on malleable for 10 days and then put on basic. In another three or four months the eighth furnace will be ready for work. Inland's No. 2 blast furnace went on basic recently after having been on malleable duty.

Railroad Machining Tools Wanted

Washington—The Greek Ministry of Transport is asking bids on tools for machining locomotive and car wheels. Specific items wanted are: an automatic car wheel lathe, an automatic inner surface turning lathe, an automatic fastener for retaining rings, and a ring bending machine. Specifications are available at the Greek Embassy in Washington or the Greek Consulate in New York City.

INDUSTRIAL SHORTS

BUILDING—Construction of a new $300,000 office building for SLOSS-SHEFFIELD STEEL & IRON CO., Birmingham, is scheduled to begin May 1. It is to be completed by Jan. 1, 1951.

CHANGES HANDS—The Merz Engineering Co. has been purchased by the LOVE MACHINE & TOOL CO., both of Indianapolis. The company will operate as Merz Engineering, Inc. with Miklos Sperling as president; Katharine Roessner, secretary-treasurer; and Earl J. Breech, vice-president in charge of sales.

FOR SALE—All possessions of the YOUNG CORP., Fall River, Mass., manufacturers of washing machines, will be auctioned off by Aaron Krock & Co., Worcester, on Apr. 25 and 26.

EXPANDING — Plans for an addition to the Grand Rapids Fisher Body plant to expand production facilities have been announced by the Fisher Body Div. of GENERAL MOTORS CORP., Detroit. The addition will contain 189,000 sq ft of floor space and will increase employment by 200 people.

PILOT PLANT — Construction has started on a new pilot plant for CORNING GLASS WORKS, Corning, N. Y., by the H. K. Ferguson Co. The pilot plant will be used to develop manufacturing processes from basic findings.

TAKES OVER—The Washington Precision Grinding Co., Washington, Pa., producers of precision ground tool steel flat and square sections, has been acquired by the PITTSBURGH TOOL STEEL WIRE CO., Monaca, Pa. The machinery and equipment of the Washington company have been moved to Monaca.

SCRAP DEALERS—BUNIS & CO. has been formed as dealers in iron and steel scrap and nonferrous scrap metals, with temporary headquarters in the Transportation Bldg., Cincinnati. Alvin W. Bunis, formerly associated with David J. Joseph Co., is head of the new firm.

RAZING—Two refining plants of the Sinclair Refining Co. at Coffeyville, Kan. and Sand Springs, Okla., have been purchased by LIPSETT INC., New York. They will be completely dismantled.

WINS ACS AWARD—Joseph Harrison Brennan, chief metallurgist, Electro Metallurgical Div., Union Carbide & Carbon Corp., Niagara Falls, N. Y. has been selected as the 1950 winner of the Jacob F. Schoellkopf Medal, by the Western New York Section of the AMERICAN CHEMICAL SOCIETY.

SAFETY DEVICE—The NEW ENGLAND COUNCIL has announced that the Lucas cable compression clamp for elevators, invented by Andrew J. Lucas of Springfield, Mass., a new safety device which closes when a cable breaks, is already being produced.

PURCHASE — The American Stove Co.'s Harvey, Ill. plant has been purchased by the HARRIS-HUB BED & SPRING CO., Chicago. The Harvey plant formerly produced Magic Chef gas stoves and will now turn out light metal kitchen cabinets and institutional furniture.

ALLOY DISTRIBUTOR — The Riverside Metal Co., Riverside, N. J., has appointed the CLIFFORD METAL SALES CO., Providence, as a warehousing distributor in the Rhode Island area, where the company is a supplier of quality copper-base alloys.

Truckers Pledge Court Battle

Continued from Page 103

Interstate Act and do not give consideration to agricultural products, in violation of the Interstate Act, they protest.

However, traffic people say the railroads have the answers to these objections.

Truckers Raising Rates

The proposed rail rates put the iron and steel highway haulers in a bad position. The rates are lower, with relatively few exceptions, than existing truck rates. In addition, the truckers, faced with higher operating costs, have filed new tariffs 15 pct higher than existing ones, to become effective May 1, the same day that the low rail rates on 80,000-lb carload shipments would go into effect.

The proposed 80,000-lb rail rates would apply on sheets and strip, tin mill products, bars, and on some pipe, tubes, and fittings, and on nails, wire, and coiled rods which are pickled, limed and baked.

The nails, wire and coiled rods were added following a meeting in Pittsburgh where shippers made suggestions for additions to the original list. The reduction does not apply to plates, structural shapes and piling and other articles, but the railroads are continuing their study and other products are likely to be added later.

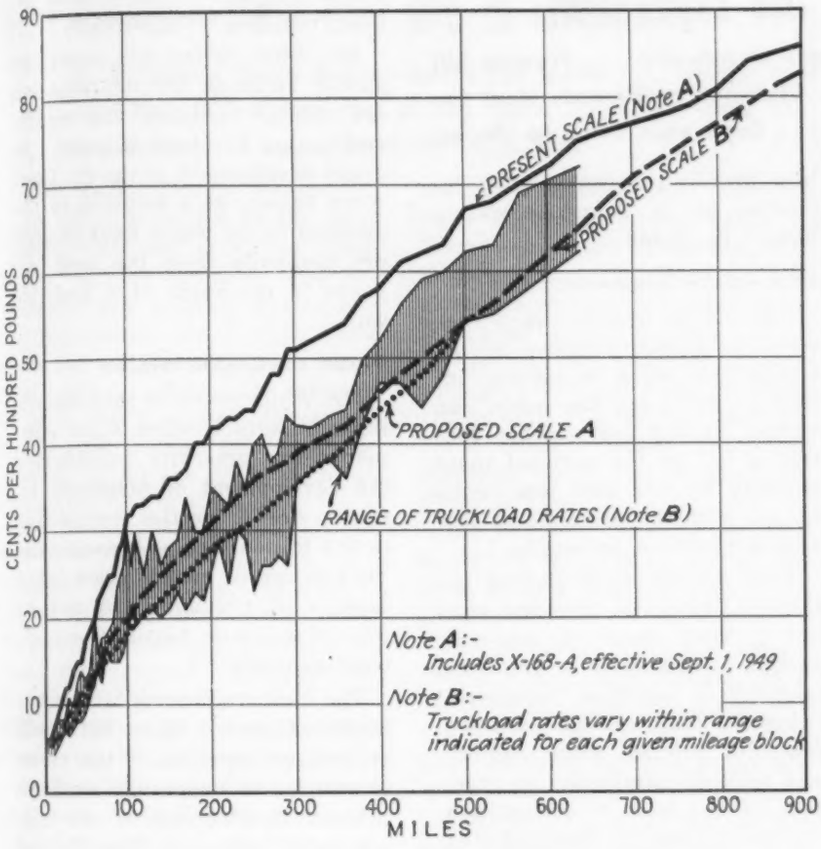
Resume Your Reading on Page 103

Western Pullman Workers To Cast Ballots for Unions

Chicago—A repeat election will be held this week to determine which union will represent employees at the West Pullman plant of the Ingersoll Steel Div., Borg-Warner Corp., Chicago.

In an earlier election this month the UAW-CIO received 521 votes and the FE-UE received 520. Five employees voted for no union and 12 votes were challenged.

Ingersoll Steel production has dropped 25 pct below scheduled production because of lack of steel, particularly slabs, drawing steel, and enameling steel.


CENTS PER HUNDRED POUNDS
MILES
PRESENT SCALE (Note A)
PROPOSED SCALE B
PROPOSED SCALE A
RANGE OF TRUCKLOAD RATES (Note B)
Note A:-
Includes X-168-A, effective Sept. 1, 1949
Note B:-
Truckload rates vary within range indicated for each given mileage block

Comparison of truck and rail rates (existing and proposed).

Export-Import Bank Gives Nod to Mexico Coal Project

Washington—Financing by the Export-Import Bank of a new coal mine and treating plant in Mexico is expected to result in a higher rate of steel production in Monclova and Monterrey.

The bank has advanced $2,740,000 for development of a coal mine and coal cleaning plant near Palau. The project, when completed, is expected to yield about 525,000 metric tons of clean coal annually.

This increased production, the bank predicted, will permit steel mills in Coahuila to step up production which has been suffering from lack of coking coal.

The loan agreement requires purchase in the United States of the necessary materials, equipment, and services. Pierce Management, Inc., of Scranton, Pa., has been designated by the bank to direct designing and construction of the facilities.

Steamers to Get Oil Power

Chicago — Oil instead of the usual coal will power two steamers of the Pittsburgh Steamship Co.'s fleet. The current re-powering program will be completed in time for the opening of the Great Lakes shipping season, reports Walter C. Hemingway, president.

In addition to the oil fuel change, the vessels' power will be raised by 50 pct and new high efficiency machinery will be installed to increase the number of trips the vessels can make with no cost increase, Mr. Hemingway said. The steamers are the Eugene W. Pargny and the Homer D. Williams, both with 13,000 tons capacity.

More Tariff Cuts on Metals Expected at Third Trade Meeting

Washington—Import duties will be further reduced on two-thirds of the tariff classifications on iron, steel, other metals, and their manufactures, excepting aluminum, is the tenor of expert prediction here. The tariff drops will be realized at the Third Reciprocal Trade Agreement meeting to be held in England this Fall.

The meeting is regarded as the first official move towards increasing foreign exports into the United States to narrow the Western European dollar gap before the Marshall Plan ends in 1952.

Mounting opposition to increasing American imports (THE IRON AGE, Apr. 13, p. 72) will be aired early in May when a House committee will hold hearings to determine the impact of higher imports on domestic employment.

On the tariff discussion list are steel ingots and other basic forms, such as blooms, slabs, sheets, plates, other major classifications, such as pig iron and steel shapes, and a wide range of metal manufactures. More than 65 of the metals classification (paragraphs 300-400) are affected.

Aluminum is not on the list. Both Reynolds Metals and Kaiser Aluminum have recently filed applications to the Tariff Commission to raise its import duties.

Allegheny Ludlum Plans Courses

Pittsburgh—It will be back to school for sales and management groups of the Allegheny Ludlum Steel Corp. under company-sponsored training courses to open June 1.

A trainee 15 years ago and now assistant manager of the Watervliet, N. Y., plant, E. H. Forsstrom has been appointed director and is now taking a refresher course. His headquarters will be in the Brackenridge plant. He is president of the Hudson Valley Chapter, Soc. for the Advancement of Management.

Steel Labeled Laggard in Ore Exploration

Probers wag threatening finger at industry . . . Promise bill for iron ore exploration . . . Chapman reprimands steel for not keeping expansion pace . . . Boyd adds voice to chorus.

Washington — The steel industry was urged by the Federal Government this week to expand its development of new raw materials sources.

Interior Secretary Oscar Chapman said Congress should pass legislation directing exploration for new iron ore sources if it finds that the steel industry is not doing an "adequate" job of exploration and development.

"Steel Growth Slow"

Secretary Chapman, testifying before a monopoly-investigating house subcommittee headed by Rep. Celler, D., N. Y., denied that he favored government entrance into the ore business at present, but said Congress "should legislate," if it finds the industry dragging its feet in tapping new reserves.

Criticizing the industry for its "failure to keep pace with an expanding national economy," Mr. Chapman said the industry should not be permitted to "jeopardize full employment and continued national economic growth." He said the industry is expanding at the rate of only 1 pct a year, as compared with an annual expansion rate of 3 pct for the entire domestic economy.

Boyd Cries, "Action!"

"We do not have the steel reinforcement for our greater national economy," Mr. Chapman declared. He said the problem was intensified by the "world-wide urge toward economic development recognized in President Truman's point-four program." James Boyd, Bureau of Mines chief, said iron ore requirements might exceed 140,000,000 tons by 1970 and urged immediate exploration programs to meet the prospective deficit.

"All possible sources of iron ore must be utilized to the fullest extent during peacetime to maintain the United States steel industry on a sound economic basis," he stated.

Incomplete Argument

Rep. Celler opened the 2-week series of public hearings by declaring that while he did not "intend to pre-judge the issue," he wanted to find out whether control of 1/3 of the national ingot capacity by one firm was "compatible with the principle of free and competitive enterprise."

Prof. George J. Stigler of Columbia University told the committee that there is not now enough competition in the steel industry to justify a "hands-off" policy by Congress. He cited basing-point pricing, price rigidity, and price discrimination as examples of the lack of competition, but did not explain their relationship to the steel industry.

Republic's White Recommends Tax Change to Improve Ore State

Washington—Integration of iron ore and steel is a marriage of economic necessity beneficial to the steel industry and the nation, Charles M. White, president, Republic Steel Corp., told the Celler Subcommittee on the Study of Monopoly Power this week.

He recommended three changes in existing tax laws to improve the iron ore situation and encourage expenditure of the money required to develop, mine and transport the new high grade iron ores found in Labrador, Liberia and Venezuela, and the beneficiation of magnetic taconite.

Development and preliminary mining expense should be recognized as operating expenses or costs of mining rather than capital investments, he said.

Also, percentage depletion should be adequate and freed from continuing threats of its elimination from the tax structure.

Mr. White added that provision should be made for depreciating ore mining facilities and equipment on an accelerated basis. He urged development of the St. Lawrence Seaway as a solution to the problem of the water haul of iron ore tonnnage from the new deposits in the event of a possible war.

Seeks Favorable Action

Mr. White revealed that Republic and certain other steel companies are presently considering the development of magnetic taconite ore properties containing over a billion tons of taconite and the erection of beneficiation plant capable of producing 10 million tons of magnetic taconite concentrate annually.

The iron ore outlook which has improved greatly since 1947, will be further improved if tax relief is granted to encourage exploration and development of ore bodies, particularly in the United States, if Congress acts favorably on the proposed St. Lawrence Seaway, and if there is an understanding and appreciation of the necessity of intimate interrelations in the iron ore and steel industries, Mr. White concluded.

Inland, Steep Rock Agree To Explore Canadian Ore Field

Chicago—Exploration of its undeveloped ore areas with an option to opening a third mine on a royalty basis with Inland Steel Co., Chicago, was reported by the Steep Rock Iron Mines, Ltd., Canada.

Inland's exploratory drilling in the Canadian fields has been deemed "highly satisfactory" by D. M. Hogarth, Steep Rock president, in his recent letter to stockholders.

He said that Steep Rock's entire 1950 output, expected to surpass 1949 tonnage, has already been sold at prices 55¢ per ton over those of 1949.

SAN ISIDRO—More Iron Ore in Venezuela

U. S. Steel's Cerro Bolivar opens the gates . . . Official report lists 300 million tons in San Isidro . . . Much more believed there . . . Rush is on—*By BILL PACKARD*

New York—Attacks by government officials leveled at the steel industry for not doing an "adequate" job of exploring and developing new sources of iron ore are ridiculous. They might have made sense 5 years ago. But they don't today. More new tonnage of iron ore has been discovered in the past 5 years than was discovered in all the other years of this century put together.

San Isidro Found

In the aftermath of the discovery of Cerro Bolivar comes news of another iron ore mountain to rival the original discovery. It is also in Venezuela within eyesight distance of the first. And that's not all. Plans are being actively pursued to develop these finds and bring the ore to American furnaces for smelting and fabrication into the multitude of steel products needed by American industry. In some cases steel firms are making developments a cooperative venture. Others are playing lone wolf roles.

The problems of getting the ore out and bringing it here are terrific. But they are being solved by free American companies. It is too late for the American government to horn in on the deal. When the ore outlook became critical about five years ago because of heavy wartime depletion of our reserves, the government missed the boat. But the steel companies didn't.

The Rush for Iron Ore

They surveyed our reserves and found cause for worry. Then they set out to find new sources of iron ore. And how they found it! Thanks to their efforts the ore outlook has brightened considerably.

Here are a few highlights in the race for iron ore:

(1) Bethlehem is energetically developing and expanding its high-grade holdings in Venezuela.

(2) Hollinger-Hanna interests have uncovered a big strike in Quebec-Labrador. More than 300 million tons of high-grade ore has already been proven. Five American steel companies have signed up to start receiving this ore as soon as a railroad from the mine can be built. These companies include Republic, Armco, Wheeling, National Steel, and Youngstown Sheet & Tube.

(3) Republic Steel has obtained an important new source of ore from Liberia and has formed the Liberia Mining Co. to exploit it.

(4) But U. S. Steel has uncovered the most fabulous discovery of all—Cerro Bolivar, the mountain of ore in Venezuela. More than 500 million tons have already been proven. This dramatic discovery came after one of the most thorough, painstaking, and comprehensive explorations in the history of iron ore searches (THE IRON AGE, Mar. 2, 1950, p. 75).

Expert Inspects Sites

U. S. Steel's discovery has started a stampede to Venezuela. It's like our own gold rush of '49, except that it is by companies instead of by individuals. The final chapter on this great wealth of ore is yet to be written, according to John Kelly, consultant mining engineer, currently retained by The New England Council. Mr. Kelly has just returned from an inspection of the ore sites at the invitation of Venezuela.

Currently in the spotlight is San Isidro, a great round mass of ore similar to Cerro Bolivar. San Isidro is located within sight of Cerro Bolivar, about 20 kilometers to the Southeast. They are separated by completely flat ground. The government of Venezuela has already received 15 applications for concessions in this area. Most are from American steel companies, although there are foreign interests among them.

When it became known how rich Cerro Bolivar was, the government closed the area to further denouncements (claim filing with 100 year privileges). This was done by taking the balance of the area out of public domain and putting it in government domain. Now it is necessary to petition for a concession. If granted, it is good for only 40 years.

U. S. Steel knew there was ore in San Isidro at the time it picked Cerro Bolivar. But it couldn't file on the whole area. Since then the government of Venezuela has been doing some exploratory work on its own. They hired a group headed by a Princeton professor to survey the San Isidro area.

May Rival Cerro Bolivar

The official government report states that there are more than 300 million tons of iron ore in San Isidro. This is based on a survey of only one-seventh of the area. Unofficially, it is learned that the government thinks there is a great deal more ore than that there.

Mr. Kelly says that on the basis of the government report and his own reconnaissance on the spot he believes San Isidro might rival the fabulous richness of Cerro Bolivar. His opinion is shared by some steel company observers who have journeyed there. Others who have been on the spot are more cautious and want to await test drilling results.

Favors Share Plan

Anyway, the race is on. The Venezuelan Government is playing it cagey. It wants to make the best deal possible before it grants a concession to this rich find. No one can blame them for that.

It is believed that the government favors granting a concession to a group of companies. The final arrangement might very well be modeled on the Labrador method.

It is learned unofficially that the government will probably insist that any railroad that is built will be used as a common carrier. It may haul oil as well as iron ore. But the ore might be brought out by dredging the Orinoco River, shortening the railroad needed.

PENSION SESSION: Insurance clerks, union men, and Inland Steel personnel discuss the pension plans.

Contributory Pension Voted in by Landslide

Pension problems put to ballot test at Inland Steel . . . 74 pct choose contributory plan . . . Poll method unique in pension settlement . . . Interviews given workers. —*By GENE BEAUDET*

Chicago—A large majority of the employees of the Inland Steel Co.'s Indiana Harbor works voted to pay part of the cost of their pensions under a contributory pension plan. This was disclosed Apr. 11 by L. B. Luellan, industrial relations director for the company, and J. B. Jeneske, international representative of the CIO United Steelworkers of America.

Of the total 11,155 workers eligible at Indiana Harbor, 74 pct or 8256 voted for the contributory plan. The remaining 2899 voted for non-contributory pensions. Seventy percent or 6571 of the employees voting for the contributory plan are members of the Indiana Harbor CIO bargaining unit while 2812 out of the 2899 voting for the non-contributory plan are members.

99 pct of Workers Vote

On a company-wide basis 9201 of the 12,519 eligible employees picked the contributory plan and 3260 chose the non-contributory plan. These figures represent 99 pct of the eligible voters in the entire company. The remainder not yet accounted for are on sick leave or vacation. However, their votes will not materially affect the result.

The Inland settlement is unique in the steel industry inasmuch as it offered the employees the choice of two pension plans. Under the non-contributory plan, a worker must have at least 15 years' service and be 65 years old before he collects benefits. An employee with 25 years' service receives maximum benefits of $100.00 per month. Of this $45.00 will come from social security and $55.00 from the company.

Payments Based on Wages

Under the contributory plan workers make payments based on their earnings. Part of the benefits come from these payments and part from the company. After two years' service with Inland an employee can join the plan. If he has been in the plan 5 years the worker can collect benefits even if he leaves the company before reaching 65 years of age.

A man retiring at the age of 65 with 25 years' service will receive a pension of $130.00 per month, including social security, if he has averaged $350.00 per month with the company and contributed $8.00 monthly to the plan. In the event that a pensioned employee dies, his widow gets a reduced pension, whereas under the non-contributory pension she would only be entitled to social security.

The pension programs were the result of the combined thinking of the union and the company. During negotiations following the steel strike last November both sides were willing to see the good points in the other's arguments.

Contributory Plan Explained

As a result, Inland agreed to a non-contributory plan and the union agreed to a contributory plan which was a revision of a former pension plan Inland had in effect for some years. All employees are covered by the non-contributory plan which provides for basic pension coverage.

It was agreed that the best way of informing the employees of the plans was to interview each one personally and explain them. After the interview the employee was given his choice.

All Workers Interviewed

The company appointed departmental interviewers to do the job. These interviewers attended plans study classes. Union representatives also attended.

Interviews were conducted mainly by company personnel but employees were encouraged to contact their union representatives to get advice. Many times the union grievance committeeman accompanied the workers to the interview. Workers were not required to decide on the spot.

ASTE CONVENTION—New Ideas for Industry

Processes covered are legion . . . tungsten carbide dies . . . investment casting . . . cold forming steel . . . tool dies of steel-rubber . . . Metamics . . . Micro-Drills . . . Automation.

Philadelphia — The men who trudged aisles flanked by machine tool exhibition booths at the Convention Hall American Society of Tool Engineer's Exposition were looking for something new and something better.

Speakers at meetings held in conjunction with the ASTE's 18th annual convention last week were prolific with ideas to cut costs, make better products and quicken the heartbeat of production.

George Eglington, vice-president of Lincoln Park Industries, Inc., Lincoln Park, Mich., said that making stampings from ultra-hard cemented tungsten carbide dies cuts costs and improves quality.

Cold Forming Saves Time

Now with the advent of unmachineable metals in jet engines and other products machining must be eliminated by "investment" casting to exact tolerances, said T. F. Frangos, of the Haynes-Stellite Div., Union Carbide & Carbon Corp., Kokomo, Ind.

Cold forming hard steel blocks into various hollow shapes saves production time, improves the quality of shells and cartridge cases for national defense, said J. P. Bowden, of the Heintz Mfg. Co., Philadelphia.

A boon to the aircraft industry may be a new steel-rubber die for tools. It lops die cost in half and permits better stretching of metal, eliminating multiple operations in forming metal parts, said R. B. Schulze, supervisor of a Manufacturing Research, Glenn L. Martin Co., Baltimore, Md.

Developed in the post-war period, the new Metamics metals, a cross between pottery and metal, are similar to powder metals. They will not crack like ceramics at sudden heating or cooling, nor will they melt at temperatures that render other metals molten, said W. O. Sweeney, Jr., of the Haynes-Stellite Div., Union Carbide & Carbon Corp., Kokomo, Ind.

Chrome-plated parts are finding their way inside machines to prolong machine life, disclosed B. A. Taylor, vice-president of the Chrome Electro-Forming Co.

Advocates Broaching

Ling "Micro Drills" can produce holes as small as about one-thousandth of an inch in diameter, reported J. A. Cupler, II, general manager of the National Jet Co., Cumberland, Md.

O. W. Bonnafe, Chief Research Engineer, LaPointe Machine Tool Co., Hudson, Mass., advocated broaching machines for reductions in manufacturing time and cost. He said that by the use of broaching rifling of gun barrels had been cut from over ½ hr per barrel to 28 seconds.

Production costs will sink with the cold rolling from strip and sheet metal such parts as metal trim, moulding, building parts, etc., according to E. J. Vanderploeg of the Yoder Co., Cleveland.

More attention to grinding drills and use of suitable guide bushings will produce accurate, finished holes without raising the drilling time, said Eugene Numrich, Avey Drilling Machine Co., Wood-Ridge, N. J.

Greater accuracy in die casting will eliminate machining operations, reported Charles Franklin, of the Rochester Products Div., General Motors, Rochester, N. Y. He explained that holes can be cast into die-cast parts.

Automation Enthusiasts

The application of manufacturing principles to designing can cut costs in final production and designing itself, said John Van Hamersveld, supervisor of Design Cost Control, Glen L. Martin Co., Baltimore, Md. He advocated providing the designer with proper techniques, processing methods and equipment to step up efficiency.

Proponents of automation, mechanical handling of parts in production, were N. L. Bean, of the Ford Motor Co., Detroit, and Thomas E. Darnton and Willard L. Mantz, of the Oldsmobile Div., General Motors Corp., Lansing, Mich.

Mr. Bean described automation applied to the production of guide bushings for the Ford V-8 engine, selected as a test by Ford. He said that only once in the entire production line are the bushings touched by hand and that even this single manual operation out of many performed automatically on 3 million bushings a month may soon be automatized.

The two Oldsmobile men said that automation was feasible in forge plants despite the heavy parts and high temperatures. They said that some 250 different types

The ASTE Elects

Philadelphia — American Society of Tool Engineers' directors met at the Benjamin Franklin Hotel last week to map out a research foundation project, appropriating $25,000 as preliminary funds. An unidentified Chicago firm contributed $25,000 to finance an Illinois scholarship fund for tool engineering and technical students. And officers were elected: President, Herbert Tigges, of Baker Brothers, Toledo, Ohio; first vice-president, J. J. DeMuth, Sligo Iron Works, St. Louis; second vice-president, R. Collins, Hughes Tool Co., Houston; third vice-president, Roger Waindel, Elgin National Watch Co., Aurora, Ill.; secretary, W. B. McClellan, Gairing Tool Co., Detroit; and treasurer, George Goodwin, Standard Electric Co., Dayton.

An Eye to Defense

Philadelphia — Strengthening industrial national defense production by closer communication with manufacturers and furnishing technical knowledge to modernize production in Marshall Plan countries are aims of the American Society of Tool Engineers, revealed Harry E. Conrad, executive secretary, at the ASTE convention last week. He said that the international cooperation program of the society will become larger in scope. An ASTE official will embark on a European tour this month to study European production needs. Technical information will be exchanged with engineering groups of other countries, following procedure established with British engineers.

of forgings totaling one million lb per day are now processed with a minimum of manual effort in the Oldsmobile forge plants.

Proof that use of highly complex interlocked transfer type machines eliminating much of the manual handling of parts in production does not necessarily increase capital investment costs is in International Harvester Co.'s $30 million tooling program to build new types of truck engines, claimed Joseph Olender, of Harvester.

Machine Tool Trends of Times Noted by Questioning of Exhibitors

Philadelphia—A survey of exhibitors at the American Society of Tool Engineers show last week brought to light several machine tool trends. Exhibitors reported that sales volume this year is improved and that interest in new equipment is high.

Some exhibitors have cleaned out their booths through on-the-floor sales. Other exhibitors commented that surprising sales activity is being shown in previously dormant areas—the South for example.

Buyers at the show ran the gamut from representatives of small shops to master mechanics of large auto plants. Buying was motivated in most cases by the wish to modernize and medium size plants show the most interest.

Seeks Higher Aluminum Tariff

Washington—Part two of domestic companies' strategy to raise import duties on aluminum for the protection of American producers came last week with Kaiser Aluminum & Chemical Corp.'s filing an application with the Tariff Commission.

The application echoed requests made three weeks ago by the Reynolds Metals Co. that duties be reviewed and revised upwards. A new rate of 4½¢ per lb on primary metal and 7¢ per lb on semi-fabricated products is sought by Kaiser. Present duties are 2¢ and 3¢ per lb, respectively, as revised downward at the Geneva 1947 conferences.

Consumer Prices Drop

New York—Consumers prices in the 12-month period ending with February 1950 dropped 1.4 pct, reports the National Industrial Conference Board. Prices dipped 0.3 pct from January '50 to February and decreases were registered in 38 of the 59 cities surveyed monthly. Purchasing power of the dollar was 62.9¢ this February, an increase over its 62.0¢ in February '49.

"Drinks are on the house, men. I finally machined those nickel slugs to the right dimensions."

New Safety Records Posted By Industrial Plants Workers

Pittsburgh—Almost 5.5 million man hours of work without a lost-time accident is the record in four plants of Oil Well Supply Co., a U. S. Steel Corp. subsidiary, over the past three years ending Mar. 1.

The Wilson-Snyder Manufacturing Division at Braddock, Pa., has not had a lost-time accident since June 16, 1945. Meanwhile, employees have worked more than three million man-hours, a record described by the National Safety Council as the best ever brought to its attention for plants in that class.

Witte Workers Get Award

Imperial Works at Oil City, Pa., has not had a lost-time accident in more than 15 months. Its total of 1,894,818 man hours without an injury as of March 1 was a new all-time safety record for the plant.

Witte Engine Works Division at Kansas City, Mo., recently received the National Safety Council's Award of Honor for working more than one million man-hours without a lost-time accident.

ECA Pours $8.7 Billion Into Europe's Economic Breach

Washington — In the first two years of the Marshall Plan, $8.7 billion has been spent to nourish an economically depressed Europe, the Economic Cooperation Administration reported recently. The dollar breakdown includes $4.1 billion, industrial goods; $3.9 billion, food and agricultural products; and the balance for ocean freight and technical services.

In the industrial classification nearly $1 billion went for machinery, mostly American, and $400 million to finance 75 basic industrial projects. About $272 million was authorized to purchase industrial machinery. Construction, mining, and conveying equipment cost $147 million.

Expenditures for metalworking

machinery came to $215 million, including $92 million for machine tools. Another $175 million purchased agricultural equipment, including $85 million for tractors and $43 million for parts.

Industrial projects in steel, power, and automotive fields financed in Italy totaled 24 at a cost of $125 million—a third of ECA spending. Twenty projects were financed in France at a cost of $110 million. Six others, costing $51 million, were financed in the United Kingdom.

Belgium got $15 million for four projects, including improvement of three steel plants. Holland used up $26 million for power production and steel plant modernization.

Most Marshall Plan dollars, about $2.4 billion, went to Great Britain, while France and territories was second with $1.8 billion. Nearly $1 billion went to Italy and more than $800 million each went to Germany and the Netherlands.

Chicago Largest U.S. Scrap Center, Scrap Institute Told

Chicago—The largest scrap collection, preparation and shipping facilities in the country are in the Chicago area, Edwin C. Barringer, executive vice president of the Institute of Scrap Iron & Steel, told members of the Chicago chapter in a recent meeting in honor of Stanley Kaplan, president.

Earlier in the day, the national board of directors, at their annual spring meeting, discussed what could be done to broaden and preserve the market for dealer scrap. Mr. Barringer announced that the annual meeting of the Institute will be held next Jan. 14, 15 and 16, at the Hotel Commodore in New York City.

Seek Freight Reduction

Speaking before the Chicago chapter, Mr. Kaplan outlined Institute objectives for 1950. He said that a general freight rate reduction for shipments of ferrous scrap was being sought, and that a reduction of about 20 to 25 pct could be expected. A program for improving scrap quality will also be undertaken to make scrap products more desirable to consumers. Mr. Kaplan said that improved scrap quality is a must.

During 1950 the Institute will accelerate their safety program to reduce operating costs by decreasing workmen's compensation and insurance premiums. Mr. Kaplan also advocated a greater use of scrap to conserve the natural resources of the country.

War Production Reserve Strength Wanes

U. S. industrial muscles shedding some might needed for war punch . . . Report to Munitions Board finds facilities weakened under government care . . . Uniform standards lacking.

Washington—The industrial war sinews of America, its dormant war production plants and equipment, are losing some of the potency needed for a sudden concerted effort under government care and maintenance, is the undercurrent of opinion in reports submitted by the Industrial Reserve Review Committee to its parent body, the Munitions Board.

Inspect Third of Plants

Over the past year, members of the committee have visited and inspected roughly a third of the 200 plants which make up the nation's industrial reserve. These were largely plants in government custody. Some stored tools and equipment were also checked.

It is questionable, the Munitions Board has been told, as to how quickly many of these plants and equipment could be put back into production should an emergency arise. It is even more problematical as to how long the machine tools and other equipment could operate under emergency conditions before breaking down.

In addition to the lack of uniform standards, the quality of maintenance is generally only "fair." In numerous instances, the committee says, the "maintenance quality has been below recognized standards" and in others, "neglect is outstanding."

More Care to Offices

Most of the inspections last year were of plants maintained at government expense, partly on the assumption that private operators who have bought or leased plants under the National Security Clause are living up to their agreements. Plants in private hands will be checked this year.

Some of the more specific committee criticisms have been: that more care seems to have been directed at the upkeep of office quarters than machinery or equipment; that control and other delicate instruments have not been removed and stored in safe and dry places; that protective coverings have been removed from equipment not replaced; and that equipment in poor condition is being stored

Viewing the News from

The ECONOMIC SIDE

By JOSEPH STAGG LAWRENCE

"Consistency, Where Is Thy Thread?"

WE are rubbing our eyes. Before us lies an analysis of a capital procurement program for Europe authorized by the ECA. The dollars are dollars taken out of the pockets of American taxpayers. They are neither loans nor investments. They are qualified gifts. They explain in part why the American Government cannot make both ends meet; why, at the peak of a cyclical boom, the country is nevertheless going deeper into debt.

J. J. Carnaud & Forges de Basse-Indre is the largest producer of tinplate in France. It now accounts for 40 pct of total production. The ECA has approved a $2 million grant to this company in order to increase its tinplate capacity. With the completion of this addition, the company will produce 57 pct of total French tinplate output.

The Societe Lorraine de Laminage Continu (SOLLAC) is a new corporate creature owned by one Saar and eight Lorraine iron and steel companies. Together these companies constitute a substantial segment of the French iron and steel industry. To SOLLAC the ECA has allocated $49,360,000. This will be used to increase ingot capacity, to construct an 80-in. continuous strip mill with an annual capacity of 700,000-850,000 tons of coils, to construct a 5-stand, 48-in. continuous cold strip mill with an annual capacity of 350,000 tons of thin sheets and tinplate.

The Fiat Co. of Italy is controlled by one family, the Agnelli. It employs 55,000 workers. Its cars account for 80 pct of all registrations in Italy. Fiat is a massive, conglomerate corporate entity with both horizontal and vertical monopoly traits, the typical big business octopus which disturbs the slumber of the valiant American Galahads who joust against the wicked trusts. The ECA has the Fiat Co. down for $25 million.

To the Steel Co. of Wales the ECA has approved a grant of $27 million. This is a new company being formed by the biggest steel masters of Wales. The final cost of the project is estimated at $240 million. How much of this total the American taxpayer will cover the ECA does not reveal. It does say: "A considerable portion of Britain's sheet and tinplate production will be concentrated into a plant of efficient and economic size."

Precisely.

The present government of the United States professes to abhor size —in this country. It is in a chronic state of apprehension over the sinister potentials of big business—in this country. Today it is regaling the public with the horrendous evidence of A & P turpitude. It is charging vigorously against investment bankers. A Senate Committee has just concluded hearings on a bill to outlaw bank holding companies. Another committee under the leadership of Senator O'Mahoney, aided by his ideological alter ego, Professor Kreps, is investigating bigness generally, that is, excepting labor, government, and the recipients of ECA bounty.

Is size an unpardonable defect only in this country and in this country only in business? Is efficient operation due to size a virtue only on the other side of the Atlantic? Does it make sense to persecute and dismember big business in this country while we applaud and underwrite concentrations of economic power abroad?

without any provision for cleaning and overhaul.

Insofar as the assembly and storage of tools and machinery under the JANMAT program is concerned, for all practical or working purposes "the true condition of this equipment is unknown."

No Broken Parts Replaced

It is explained that under present procedure, all JANMAT equipment is being torn down, cleaned, inspected and reassembled as required. However—no worn, defective or broken parts are being replaced during this operation.

Whatever replacement needs and deficiencies are discovered are merely being reported on a standard form. No effort is being made to compile total needs or to prepare standby, emergency orders.

The greatest delay usually experienced by operators is in the availability of spare machine tool and equipment parts. Even were the needed JANMAT replacement parts already on order, normally from 6 to 8 months would be required for delivery after the go ahead signal is given.

Good Job in Many Cases

Also, the committee has found that some plant lay-ups might well be termed phony insofar as working purposes are concerned. In plain words, the job of inactivating the plant and preparing it as a set-aside has been excellent. But in some cases, vital equipment, perhaps small in value or quantity, has been removed and never replaced.

These criticisms do not mean that all government care and maintenance is sloppy or wanting. The committee says a good job is being done in many cases and particularly on the more than 14,000 tons of industrial reserve equipment turned over to the Public Buildings Administration. This comprises about 16,000 items.

Nearly half has been dismantled, repaired and reassembled by qualified workers. Spot tests are planned for random items by placing them in production lines for short periods of time.

Debut of New Machines For Powdered Metal Figures in Pact

New York—An interesting new line of machines for processing powdered metal parts is expected to result from a recently concluded agreement between the Arthur Colton Div., Snyder Tool & Engineering Co. and Michigan Powdered Metal Products Co.

John Haller, president of Michigan Powdered Metal Co., is well known in the metalworking field for his work in powdered metallurgy — especially as applied to production of "oil-well" bearings.

On page 91 of this issue is a story describing powder parts now being made with interior cavities which serve as oil reservoirs, prolonging self-lubricating of powder bearings by 500 to 600 pct—Ed.

The machines used by his company in producing these parts were designed and built by Mr. Haller and are protected by patents.

Interest in these machines by other powdered metal fabricators led to the alliance between Mr. Haller, whose chief interest is production, and Snyder-Colton, who are machinery builders.

To the present line of Colton rotary preform presses will be added the Colton-Haller line of vertical, single-punch hydraulic presses. These will incorporate the Haller patented design and operating features. All presses will be custom built. John Haller will act as consultant with Colton engineers.

Ferry Picked Assn. Head

Detroit—Hugh J. Ferry, president and treasurer of Packard Motor Car Co., has been elected treasurer and a member of the board of directors of the Automobile Manufacturers Assn. Ferry has been active with Packard for more than 40 years. He became president Jan. 1, 1950.

Record Car Month Predicted

Detroit—New car registrations for February are expected to exceed any previous February in history by more than 100,000 units according to statisticians of R. L. Polk & Co., Detroit. They estimate February registrations may reach 402,000 units compared with only 299,701 in February 1941.

Weirton Steel Co. Orders New Equipment for Strip Mill

Pittsburgh—With the installation of $840,000 worth of electrical equipment now on order, Weirton Steel Co. will double the speed of a 36-in 4-stand tandem cold reduction strip mill at Weirton, W. Va.

Westinghouse Electric Corp. will build and install the equipment, which will increase the maximum speed of the mill from approximately 1500 fpm to 3000 fpm of light gauge steel. Horsepower will more than double—from 4100 to 10,000. The mill was built in about 1935.

The revamped mill will produce the full range of low carbon strip from 18 to 34 inches wide, with finishing gauges from seven-thousandths to five-hundredths of an inch.

Equipment to be installed includes four motors to power the mill stands and one for the reel, and a synchronous motor-generator set with an 8000 hp driving motor to operate with an existing motor generator set.

STEEL PRODUCTION (Ingots and Steel for Castings)

As Reported to American Iron & Steel Institute

Period	OPEN HEARTH		BESSEMER		ELECTRIC		TOTAL		Calculated Weekly Production (Net Tons)	Number of Weeks in Month
	Net Tons	Percent of Capacity	Net Tons	Percent of Capacity	Net Tons	Percent of Capacity	Net Tons	Percent of Capacity		
January	7,131,519	96.5	379,252	80.6	419,601	71.9	7,930,372	93.9	1,790,152	4.43
*February	6,142,178	92.0	255,565	60.2	395,502	75.0	6,793,245	89.1	1,698,311	4.00
†March	6,728,855	91.0	265,726	56.5	451,726	77.4	7,446,307	88.2	1,680,882	4.43
†1st Quarter	20,002,552	93.2	900,543	65.9	1,266,829	74.7	22,169,924	90.4	1,723,944	12.86
January, 1949	7,287,683	101.1	408,552	92.6	487,260	93.8	8,183,495	100.2	1,847,290	4.43
February	6,633,779	102.0	379,698	95.3	467,247	99.6	7,480,724	101.4	1,870,181	4.00
March	7,473,901	103.7	430,176	97.5	483,850	93.2	8,387,927	102.7	1,893,437	4.43
1st Quarter	21,395,363	102.3	1,218,426	95.2	1,438,357	95.4	24,052,146	101.5	1,870,307	12.86
April	7,015,611	100.5	404,095	94.6	365,570	72.7	7,785,276	98.4	1,814,750	4.29
May	6,889,230	95.6	400,741	90.9	299,751	57.7	7,589,722	92.9	1,713,256	4.43
June	5,954,619	85.3	349,196	81.8	194,386	38.8	6,498,201	82.2	1,514,732	4.29
2nd Quarter	19,859,460	93.8	1,154,032	89.1	859,707	56.4	21,873,199	91.2	1,681,260	13.01
1st 6 months	41,254,823	98.0	2,372,458	92.1	2,298,064	75.8	45,925,345	96.3	1,775,236	25.87
July	5,307,471	73.8	300,235	68.2	171,415	33.1	5,779,122	70.9	1,307,491	4.42
August	6,101,499	84.7	355,335	80.6	257,910	49.7	6,714,744	82.2	1,515,744	4.43
September	5,992,306	86.1	350,282	82.2	247,601	49.3	6,590,189	83.5	1,539,764	4.28
3rd Quarter	17,401,276	81.5	1,005,853	76.9	676,926	44.0	19,084,055	78.8	1,453,470	13.13
9 months	58,656,099	92.5	3,378,311	87.0	2,974,990	65.1	65,009,400	90.4	1,666,908	39.00
October	814,374	11.3	.....	.....	111,059	21.4	925,433	11.3	208,901	4.43
November	3,805,730	54.5	172,270	40.3	238,262	47.4	4,216,262	53.3	982,812	4.29
December	6,951,572	96.7	396,075	90.0	389,611	71.3	7,717,258	94.7	1,745,986	4.42
4th Quarter	11,571,676	54.1	568,345	43.4	718,932	46.7	12,858,953	53.1	978,611	13.14
2nd 6 months	28,972,952	67.8	1,574,198	60.2	1,395,858	45.3	31,943,008	66.0	1,215,950	26.27
Total	70,227,775	82.8	3,946,656	76.0	3,693,922	60.4	77,868,353	81.0	1,493,448	52.14

Note—The percentages of capacity operated are calculated on weekly capacities of 1,668,287 net tons open hearth, 106,195 net tons Bessemer and 131,786 net tons electric ingots and steel for castings, total 1,906,268 net tons; based on annual capacities as of January 1, 1950 as follows: Open hearth 86,984,490 net tons, Bessemer 5,537,000 net tons, Electric 6,871,310 net tons, total 99,392,800 net tons.

* Revised.

† Preliminary figures, subject to revision.

Note—The percentages of capacity operated are calculated on weekly capacities of 1,626,717 net tons open hearth, 99,559 net tons Bessemer and 117,240 net tons electric ingots and steel for castings, total 1, 843,516 net tons; based on annual capacities as of January 1, 1949 as follows: Open hearth 84,817,040 net tons, Bessemer 5,191,000 net tons, Electric 6,112,890 net tons, total 96,120,930 net tons.

● **Corrosion resistant** ● **Extra strength**
● **Shiny smooth finish** ● **Uniform temper**

KEYSTONE'S GALVANIZED MB WIRE offers improved corrosion resistance . . . gives added life and strength to mechanical springs subject to rust and corrosive conditions.

This is due to Keystone's unique method of galvanizing the wire *before* it is cold-drawn. The drawing process smooths and hardens the galvanized finish, increasing its lasting qualities remarkably. Other advantages are its lustre-bright shiny smooth finish . . . even, uniform temper . . . and high tensile strength.

Keystone is prepared to help solve any of your industrial wire problems. If special treatment is called for, Keystone's metallurgical research and testing facilities are available to supply the answers. We welcome your inquiry.

KEYSTONE
STEEL & WIRE CO.
SPECIAL ANALYSIS WIRE SETTING NEW STANDARDS OF PERFORMANCE
PEORIA ILLINOIS

Steel Construction News

Fabricated steel awards this week included the following:

1710 Tons, Longview, Wash., Columbia River bridge, through Guy F. Atkinson Co., Portland, to Bethlehem Pacific Coast Steel Corp., Portland.

325 Tons, Reading, Pa., castings paint shop for Textile Machine Works, to Reading Steel Products, Reading, Pa.

310 Tons, Troy, Iowa, Linn County bridge project S-326/2/ to American Bridge Co.

257 Tons, Denver, miscellaneous structural steel for Canyon Ferry power plant, Bureau of Reclamation, Spec. 2919, to American Bridge Co., Denver.

175 Tons, Poughkeepsie, N. Y., field house for International Business Machine Co., to Anthracite Bridge Co., Scranton, Pa.

150 Tons, Burnsville, N. C., textile mill, to Dave Steel Co., Charlottesville, N. C.

130 Tons, Glenside, Pa., Harry A. Prock Cabinet Co., Glenside, Pa., factory building, to Bethlehem Steel Co., Bethlehem.

110 Tons, Rochester, Minn., Franklin Heating Station to St. Paul Foundry Co., St. Paul.

Fabricated steel inquiries this week included the following:

1550 Tons, Allegheny County, Pa., Plum Creek Viaduct, Pennsylvania Turnpike Authority, Western Extension, due Apr. 26.

1520 Tons, Westmoreland County, Pa., Brush Creek Viaduct, Pennsylvania Turnpike Authority, Western Extension, due Apr. 26.

825 Tons, Allegheny County, Pa., Willow Run Viaduct, Pennsylvania Turnpike Authority, Western Extension, due Apr. 26.

750 Tons, Wilmington, Del., apartment house for J. Frank Darling, Wilmington, due May 1.

476 Tons, Denver, twin arch bridges over South Platte River, between River Dr. and Market St., State Highway Dept., bids to Apr. 21.

475 Tons, Bucks County, Pa., Pennsylvania Dept. of Highways, due May 12.

355 Tons, Plymouth, Mass., bituminous macadam and nine bridges. Completion date June 1, 1951.

266 Tons, Los Angeles, bridges, Rosemead Blvd. between Garvey Ave. and Valley Blvd., California Div. of Highways, Los Angeles, bids to May 11.

237 Tons, Douglas Co., Ore., bridge near Roseburg on Pacific Highway, Oregon State Highway Commission, Portland, bids to Apr. 25.

210 Tons, Lackawanna County, Pa., Pennsylvania Dept. of Highways, LR9 (16a), due May 5.

202 Tons, San Benito Co., Calif., bridge between Chittenden Rd. and one mile north of San Benito River, California Div. of Highways, Sacramento, bids to May 10.

135 Tons, Phillipsburg, N. J., Joint Toll Bridge Commission, eastern approaches to Delaware River Bridge, due May 1.

131 Tons, East Hartford, Conn., 50 foot span rolled beam bridge and 845 feet bituminous macadam pavement. Bridge is on East Hartford, Glastonbury Expressway. E. B. Bowditch, Hartford, resident engineer of construction.

130 Tons, Westmoreland County, Pa., Pennsylvania Dept. of Highways, LR 69 (1), due May 5.

Turn to Page 116

Production Up 50%
Labor Costs Down 50%
OUR CLAIM . . .
PROVEN BY OUR CUSTOMERS

PRODUCTION UP AT BLACK, SIVALLS & BRYSON, INC., KANSAS CITY, MO.

"The Worthington-Ransome turning rolls shown in the picture permit efficiency on repetitive work up to 90% and better—based on accurately measured arc-time. This might compare with 10 to 15% efficiency *without* the turning rolls."

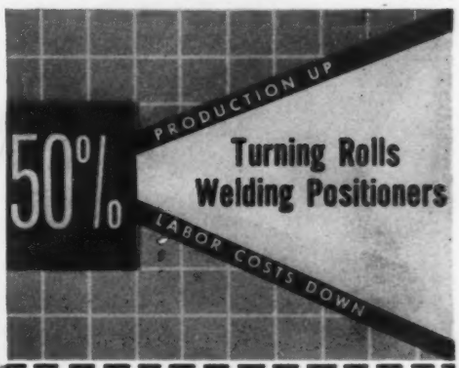
LABOR COSTS DOWN 50% AT DALLAS TANK COMPANY, DALLAS, TEXAS

"The savings resulting from the use of Worthington-Ransome turning rolls result in a reduced labor cost of approximately 50% over hand methods. We have found your equipment to be entirely satisfactory and to give long maintenance-free service."

Time saved when Worthington-Ransome Turning Rolls "handle" the work for you means *more arc time* per day. All welds are made in the "down hand" position with heavier electrodes for neater, better welds.

The improved Worthington-Ransome line includes three models, with standard capacities from 3 to 75 tons, up to 14 feet in diameter, stationary or self-propelled. (Rolls for heavier or larger work also available.) Also: positioners with capacities from 100 lbs to 20 tons.

Y 9.4



WORTHINGTON

WORTHINGTON PUMP AND MACHINERY CORPORATION

Welding and Assembly Positioning Equipment Division

DUNELLEN, NEW JERSEY

Worthington Pump and Machinery Corp.
Dunellen, N. J.

Please send Bulletin 228 on Worthington-Ransome Turning Rolls.

NAME .....

COMPANY .....

ADDRESS .....

You too,
may find
INGERSOLL
your
"Better Source"
for
these three
Special Steels

We Invite Your Inquiries

INGERSOLL STEEL DIVISION
BORG-WARNER CORPORATION
310 South Michigan Avenue, Chicago 4, Illinois
Plants: Chicago, Illinois; New Castle, Indiana; Kalamazoo, Michigan

ENGINEERING B-W PRODUCTION

Steel Construction News

Continued

Reinforcing bar awards this week included the following:

1174 Tons, Los Angeles, drainage channel, Sawtelle-Westwood system, Los Angeles Dist., Corps of Engineers, CIVENG-04-353-50-21, through Webb & White, to Bethlehem Pacific Coast Steel Corp.

440 Tons, Urbana, Ill., Animal Science Building, University of Illinois to Sumner S. Sollitt Co., Chicago.

273 Tons, Longview, Wash., Columbia River bridge, through Guy F. Atkinson Co., Portland, to Soule Steel Co., Portland.

148 Tons, Gary, Ind., Budd Mfg. Co., building through S. N. Nielson Co., Chicago, to Bethlehem Steel Co.

148 Tons, Waupon, Wis., sewage disposal, through Central Construction Co., Oshkosh, Wis., to Cook and Brown.

135 Tons, Marshalltown, Iowa, Fisher Governor Co. building through A. H. Neumann, contractor, Des Moines, Ia., to Bethlehem Steel Co.

Reinforcing bar inquiries this week included the following:

601 Tons, Yuma, Ariz., Mohawk Canal structures, Bureau of Reclamation, Yuma, Spec. 2972, bids to May 9.

515 Tons, Eugene, Ore., viaduct, East Eugene grade separation structure, Oregon State Highway Commission, Portland, bids to Apr. 25.

341 Tons, Los Angeles, highway construction and bridges, Rosemead Blvd., between Garvey Ave. and Valley Blvd., California Div. of Highways, Los Angeles, bids to May 11.

243 Tons, Isabella, Calif., outlet works, Isabella Dam, Sacramento Dist., Corps of Engineers, CIVENG-04-203-50-35, bids to May 18.

190 Tons, Denver, twin arch bridges over South Platte River, between River Dr. and Market St., State Highway Dept., bids to Apr. 21.

173 Tons, San Benito Co., Calif., bridge and highway construction between Chittenden Rd. and one mile north of San Benito River, California Div. of Highways, Sacramento, bids to May 10.

110 Tons, Salem, Ore., Marion St. bridge across Willamette River, Oregon State Highway Commission, Portland, bids to Apr. 24.

110 Tons, Boston, Mass., construction of an area for a new playground between Charles River locks and Longfellow bridge. Completion date July 31, 1950.

Steel plate inquiries this week included the following:

128 Tons, Walla Walla, Wash., two gantry cranes, Walla Walla District, Corps of Engineers, CIVENG-45-164-50-118 and 45-164-50-117, bids to May 10.

Welded Structure Going Up

Cleveland—One of the largest welded structures erected in recent years is the new publishing plant of the Baltimore Sun, Baltimore, Md., now under construction, according to Lincoln Electric Co., suppliers of the welding equipment. The six-story building will have a floor area of 325,000 sq ft and will contain 2200 tons of steel.

ECONOMY!

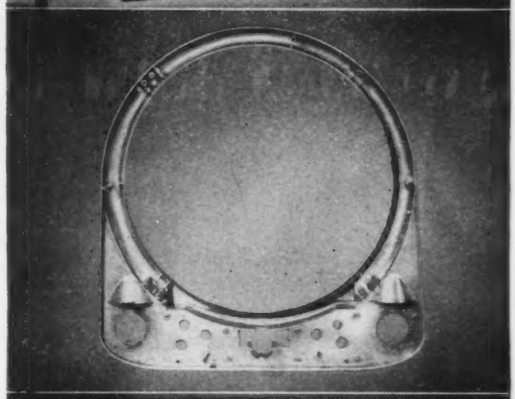
...ONE-PIECE CONSTRUCTION CUTS PRODUCTION COST, SIMPLIFIES ASSEMBLY AND IMPROVES APPEARANCE

CUTS PRODUCTION COST →

By any method of production other than die casting, the combination screen bezel and control panel on this new Zenith television receiver would be an assembly of several parts—instead of a single ZINC Die Casting! Furthermore, as a die casting, there is no scrap loss.

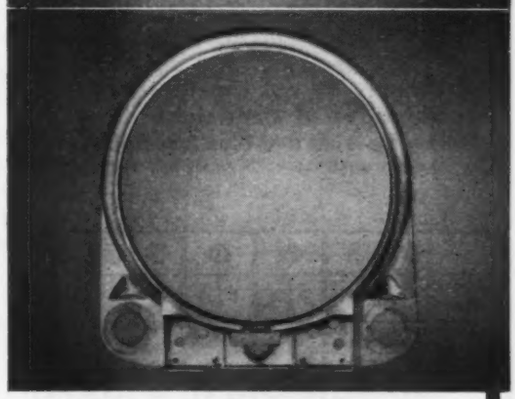
SIMPLIFIES ASSEMBLY →

This rear view of the bezel-panel casting reveals the various cored openings and integral fastening elements which simplify assembly. The openings are accurately positioned and thus assure easy lining up of the controls. The rigidity of the ZINC die casting also aids assembly. When the casting is drawn against the picture tube, the rigid bezel places the tube in the correct plane with the bezel opening.



IMPROVES APPEARANCE →

The smooth as-cast surfaces of this part—at the focal point of the television receiver—are easily finished in a combination of plating and paint. The raised ring on the bezel (see front view here) is brass plated. The balance of the bezel receives a tinted lacquer and the control panel an enamel finish.



There are many other ways in which ZINC die castings can lower production costs without sacrifice of quality. These are the reasons why ZINC die castings are the most widely used. Every die casting company is equipped to make ZINC die castings and will be glad to discuss their advantages with you—or write to us.

The New Jersey Zinc Company, 160 Front Street, New York 7, New York.

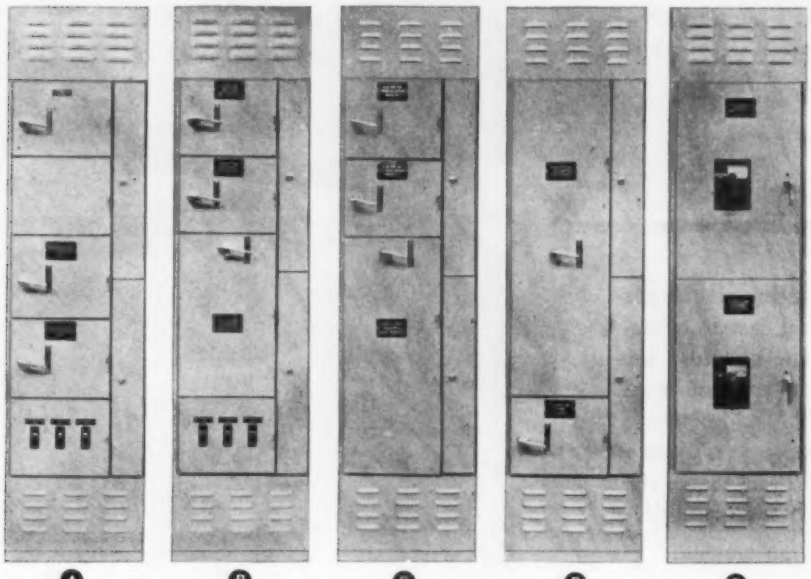
ZINC
FOR DIE CASTING ALLOYS

The Research was done, the Alloys were developed, and most Die Castings are based on
HORSE HEAD SPECIAL (99.99 + % Uniform Quality) ZINC

FOR *Flexible* BUT *Standardized* MOTOR CONTROL INSTALLATIONS

use CLARK CONTROL CENTERS

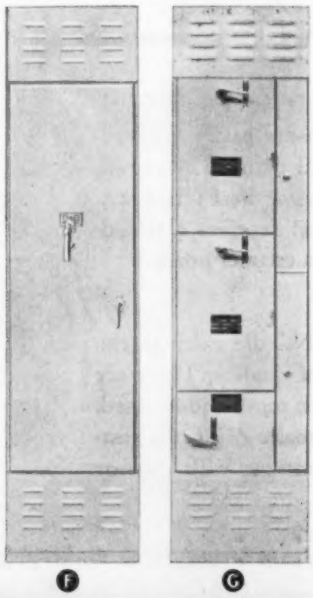
Any combination of sections may be erected in a straight line or in any right angular pattern to fit around corners or columns. With louvres top and bottom, total height of sections is 90 inches. Plug-in connectors, vertical bus, interlocking handles for Circuit Breakers or Disconnect Switches, locking provision on each door, easily accessible 6 inch wiring troughs and many other desirable features are incorporated in CLARK CONTROL CENTERS.



Ⓐ Ⓑ Ⓒ Ⓓ Ⓔ

Units may be put together in any combination of sizes shown in the following table and illustrated above.

	Ⓐ	Ⓑ		Ⓒ		Ⓓ		Ⓔ	Ⓕ	Ⓖ	
NUMBER OF UNITS	5	3	1	2	1	1	1	2	1	1	2
UNIT HEIGHT	13	13	26	13	39	13	52	32½	65	13	26
UNIT WIDTH	24	24	24	24	24	24	24	24	24	24	24
UNIT DEPTH	20	20	20	20	20	20	20	20	20	20	20



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Ask for Descriptive Bulletin 6200

THE CLARK CONTROLLER CO.

ENGINEERED ELECTRICAL CONTROL • 1146 EAST 152ND STREET, CLEVELAND 10, OHIO

Dates to Remember

Apr. 24—Packaging Machinery Manufacturers Institute, semiannual meeting, Hotel Sheraton, Chicago. Institute headquarters are at 342 Madison Ave., New York.

Apr. 25-26—Metal Powder Assn., annual metal powder show, Book-Cadillac Hotel, Detroit. Association headquarters are at 420 Lexington Ave., New York.

Apr. 27-28—American Steel Warehouse Assn., annual meeting, Shamrock Hotel, Houston. Association headquarters are at 442 Terminal Tower, Cleveland.

May 4-5—National Machine Tool Builders' Assn., spring meeting, Edgewater Beach Hotel, Chicago. Association headquarters are at 10525 Carnegie Ave., Cleveland.

May 8-12—American Foundrymen's Society, annual convention and exhibition, Public Auditorium, Cleveland. Society headquarters are at 222 W. Adams St., Chicago.

May 10-12—Machinery Dealers' National Assn., annual convention, Hotel Statler, Detroit. Association headquarters are at 20 N. Wacker Drive, Chicago.

May 15-17—Industrial Furnace Manufacturers Assn., annual meeting, The Homestead, Hot Springs, Va. Association headquarters are at 420 Lexington Ave., New York.

May 22-24—American Supply & Machinery Manufacturers' Assn., Industrial supply convention, Convention Hall, Atlantic City, N. J. Association headquarters are at 1108 Clark Bldg., Pittsburgh.

May 24-25—American Iron & Steel Institute, annual meeting, Waldorf-Astoria Hotel, New York. Institute headquarters are at 350 Fifth Ave., New York.

May 26-27—Society for Applied Spectroscopy, annual meeting, Socony-Vacuum Training Center, New York. Society secretary is Ruth Abbott, American Cyanamid Co., Bound Brook, N. J.

June 1-2—American Society for Quality Control, national convention and midwest conference, Milwaukee Auditorium, Milwaukee. Society headquarters are at 4949 W. 65th St., Chicago.

June 4-9—Society of Automotive Engineers, summer meeting, French Lick Springs Hotel, French Lick, Ind. Society headquarters are at 29 W. 39th St., New York.

June 5-7—American Gear Manufacturers Assn., annual meeting, The Homestead, Hot Springs, Va. Association headquarters are in the Empire Bldg., Pittsburgh.

June 12-16—American Electroplaters' Society in collaboration with the Electrodepositors' Technical Society of England, international electrodeposition conference, Statler Hotel, Boston. Society headquarters are at 473 York Road, Jenkintown, Pa.

June 19-23—American Society of Mechanical Engineers, semiannual meeting, Hotel Statler, St. Louis. Society headquarters are at 29 W. 39th St., New York.

Oct. 23-27—National Metal Congress & Exposition, International Amphitheater, Chicago. American Society for Metals headquarters are at 7301 Euclid Ave., Cleveland.

NOW Line-O-Power

STRAIGHT LINE DRIVES

DOUBLE REDUCTION

high quality
economy
efficiency

TRIPLE REDUCTION

CHECK THESE *Line-O-Power* features

✓ ***ECONOMICAL TO BUY***—Lower original cost because these units are designed for manufacture on latest and most accurate high production machine tools.

✓ ***ECONOMICAL TO OPERATE***—Straightforward, enclosed offset shaft principle of design gives efficiencies of 96% or higher. Simplified construction—minimum number of moving parts—direct splash lubrication—quality workmanship hold maintenance to a minimum.

✓ ***DUTI-RATED HELICAL GEARS***—Duti-Rated high hardness helical gears manufactured to rigid standards assure exceptional accuracy, long life and dependability.

✓ ***MODERN APPEARANCE***—The last word in clean-looking, modern design. The streamlined Line-O-Power unit on original equipment highlights the designer's approach to functional, efficient equipment.

✓ ***COMPACT — SAVES SPACE*** — Compact because the entire housing volume has been utilized to attain speed reduction. Placement of input and output shafts in a direct line brings the coupled motor and speed reducer into a narrow line of power transmission.

✓ ***LARGE OVERHUNG LOAD CAPACITY***—Conservatively selected, large capacity antifriction bearings and husky output shafts assure maximum overhung load capacity.

✓ ***STURDY HOUSINGS***—The housings of Line-O-Power Drives are rugged, dense, sturdy castings to give maximum rigidity and minimum deflection under load.

✓ ***LARGE RANGE OF SIZES AND RATIOS***—A large range of double and triple reductions for capacities from 1 to 200 horsepower. Ratios from 5 to 1 up to 238 to 1 available for prompt delivery.

✓ **APPLICATION ADAPTABILITY**—Line-O-Power drives will transmit power from any prime mover and are adaptable for horizontal side-wall or ceiling mounting upon order.

Here is a newly developed drive that offers high quality combined with economy both in original cost and in operation.

Line-O-Power Units use Foote Bros. Duti-Rated high hardness helical gears for long life, quiet operation and compactness.

Line-O-Power Drives are the last word in modern symmetrical design. Wherever enclosed gear drives are used, they assure a clean-cut, efficient power package unit.

FOOTE BROS. GEAR AND MACHINE CORPORATION
Dept. M, 4545 S. Western Boulevard Chicago 9, Illinois

FOOTE BROS.

Better Power Transmission Through Better Gears

Foote Bros.-Louis Allis Gearmotors

Maxi-Power Helical Gear Drives

Hygrade Worm Gear Drives

WRITE FOR BULLETIN LPA
Foote Bros. Gear and Machine Corporation
Dept. M, 4545 S. Western Blvd.
Chicago 9, Illinois

Please send me a copy of Bulletin LPA on Foote Bros. Line-O-Power Drives.

Name.....

Company.....

Position.....

Address.....

City.....*State*.....

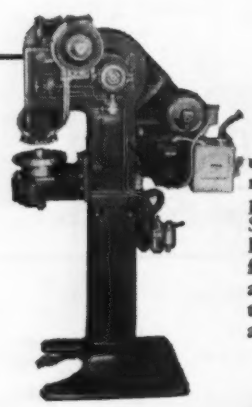
SET RIVETS
and CLINCH NUTS *faster* with
T-J
REDUCE COSTS!

Speed up assembly operations . . . bring costs down . . . with T-J Rivitors and Clinchors! Ideal for automotive, household appliances, farm machinery, toys, stampings of all kinds, many other uses.

You get *high production* with T-J Rivitors . . . designed to automatically feed and set solid rivets. No manual rivet handling . . . easy for women operators. Sets many types of rivets . . . 1/16" to 1/4" diam. solid steel rivets up to 7/8" long using *electrically powered* Rivitor . . . aluminum alloy rivets up to 1/4" diam. or steel rivets up to 1/8" diam. and up to 3/4" long, using *air powered* Rivitor. Throat depths, 8" to 36".

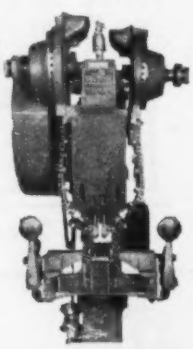
T-J CLINCHOR . . . available in Underfeed (shown here) and Gravity feed models. Capacity of standard machines is 9/16" O.D. to 3/4" O.D. "D" type clinch nuts, 17/32" to 29/32" square "Case" type clinch nuts, and extruded type clinch nuts. Range of throat depths, 8" to 36".

You can set clinch nuts 3 to 5 times faster with a T-J Clinchor! Fully automatic . . . controlled by a single foot pedal. Output limited only by speed with which operator can feed work to machine. T-J engineered dependability. Write for Clinchor bulletin 847; Rivitor bulletins 646 and 847. The Tomkins-Johnson Co., Jackson, Mich.



T-J RIVITOR used for automotive clutch plate assembly. Saves time and labor doing a four-fold job—assembling, setting, inspecting and ejecting.

TWIN RIVITOR used for riveting flat steel springs to mounting brackets for automobile horns.



33 YEARS EXPERIENCE T-J

TOMKINS-JOHNSON

RIVITORS . . . AIR AND HYDRAULIC CYLINDERS . . . CUTTERS . . . CLINCHORS

• *News of Industry* •

Unions Contend for Funds Handed Over to Court by GM

Detroit—With two unions laying heavy claims on $139,199 union initiation fees, dues and assessments collected by General Motors in its four divisions, the company washed its hands of responsibility for the funds and turned them over to the Detroit Federal District Court, recently.

The money, collected since November 1949, is claimed by the United Electrical, Radio and Machine Workers of America, CIO, and the newly-organized International Union, Electrical Radio and Machine Workers, CIO. GM disclaims responsibility for the money and seeks to have the IUE made a defendant in litigation to determine which union is entitled to the funds.

Anticipate Drop in Nonferrous Metals Sale to Western Europe

Washington — Marshall Plan needs for nonferrous metals from outside Europe are expected to decline during the last two years of the program. During the past 12 months, countries of Western Europe bought $314 million from dollar sources. The estimate for the next two years is $301 million and $245 million respectively.

Authorizations during the first two years of the program were copper and copper products, $247 million; aluminum and aluminum alloys, $109 million; ores, $83 million; zinc and zinc alloys, $71 million; lead and lead base alloys, $57 million; brass, $7 million; tin, $2 million and miscellaneous, $12 million.

Runs Domestic Heat Corp.

Cleveland—Domestic Sheet Metal Co. has taken over operations of Domestic Heat & Equipment Corp., here. President of the new organization is C. M. Penney. Edward M. Blatz is vice-president and Gordon Justen is shop and installation foreman. Domestic Sheet Metal specializes in warm air heating and sheet metal work.

DANLY PRESSES

Easier, because the entire Danly Press Control System is designed especially for press operation —safer because both operator and press are protected by special automatic provisions in the press control circuits. Safeguards include anti-repeat relays, supervisory circuits which stop the press instantly on drop in oil or air pressure and slide travel limit switches. Single wire grounded secondary circuits are used throughout the system to prevent grounds from accidentally energizing control devices. A key locking master panel selector switch provides positive control of the press running cycle by authorized personnel once a job has been started.

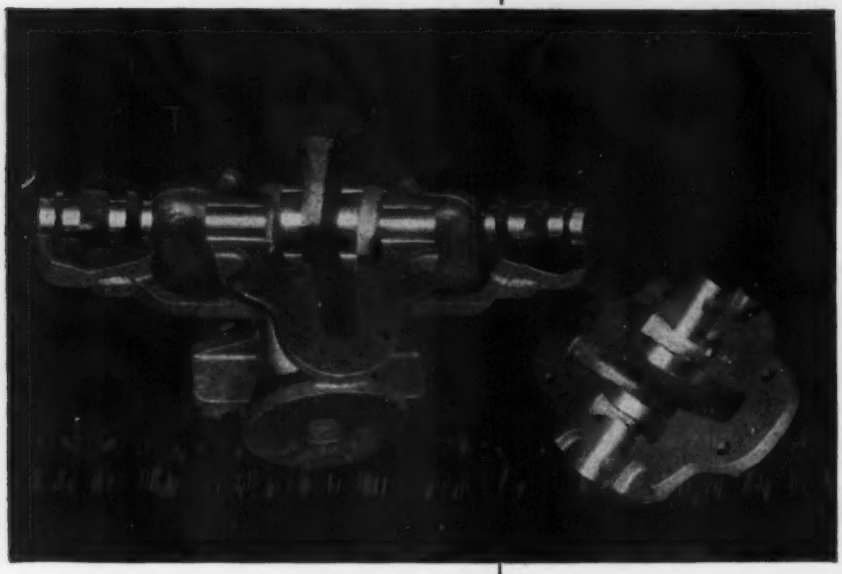
The Danly Press Control System typifies the careful engineering attention devoted to every detail of Danly Press design and construction . . . that's why it costs less to run a Danly Press! Write today for detailed information on the advantages of Danly Press Controls in your press room.

DANLY®

DANLY MACHINE SPECIALTIES, INC.
2100 SOUTH 52ND AVENUE • CHICAGO 50, ILLINOIS

CORROSION... *Checkmated!*

WITH LEBANON STAINLESS CASTINGS



Finish-machined casting of a Centrifugal Pump Casing made at Lebanon of Circle L 22 Stainless Steel.

METALLURGISTS AND PRODUCTION MEN are pointing the way to corrosion control by the use of stainless alloys. These alloys range from the general purpose (19-9) to the highly specialized types, each particularly suited to service requirements. Lebanon Circle Ⓛ 22 (analysis at right) is a typical example of a stainless alloy that adds years of usefulness to any casting that must withstand corrosive attack.

Lebanon laboratory and production techniques play an important part in maintaining the high quality of our castings. Modern electric induction furnaces provide maximum flexibility of control so valuable in processing alloy material.

Our engineers are at your service, anxious always to help you solve your problems by developing entirely satisfactory castings.

If you do not have copies of our Data Sheets we will be glad to send them on to you.

LEBANON CIRCLE Ⓛ 22

NOMINAL ANALYSIS

Carbon Max.	0.08
Silicon	1.25
Manganese	0.75
Chromium	19.50
Nickel	9.00

NOMINAL PHYSICAL PROPERTIES

Tensile Strength	75,000
Yield Point	36,000
Elongation in 2"—%	50
Brinell Hardness	135

HEAT TREATMENT:
Water Quenched

LEBANON STEEL FOUNDRY • LEBANON, PA.
"In the Lebanon Valley"

LEBANON *ALLOY AND STEEL* Castings

CIRCLE L

• *News of Industry* •

Largest Shipments of Foreign Ore Arrives in America in 1949

New York—Foreign iron ore shipments of 8,300,000 tons from 18 countries in 1949 comprised the largest shipment ever to reach the United States, the American Iron and Steel Institute reported. It was an increase of 22 pct over 1948 when imports were 6,800,000 tons. Sweden, Chile, and Canada were the principal suppliers.

Aware that ore supply lines must be widened because of dwindling supply of high grade domestic iron ores, steel executives were active in exploring and developing large iron ore deposits in South America, exploring Quebec-Labrador deposits, and building facilities for the shipment of Liberian ore.

Core of the problem is the necessity for supplementing the nation's high grade ores with new sources while research proceeds toward the economical use of taconite and low grade ores plentiful in the Lake Superior region.

Estimates on the capital investment for the taconite program put the cost at $15-$20 per ton of annual capacity for producing taconite concentrates. At least $300 million must be invested to produce 20 million tons of taconite concentrate yearly.

If the steel industry were to replace the present Lake Superior natural ore supply with a taconite supply alone, it would have to invest in iron ore facilities $1.25 billion to $1.75 billion.

Diesel Mechanics Course Opens

New York—To meet heightened demand for diesel mechanics caused by the increasing shift to diesel-driven trucks and buses, the Mack Truck Co. is holding free training courses in New York, Boston and Albany. Nation-wide expansion is planned for the course which presents a transition to the gasoline engine mechanic.

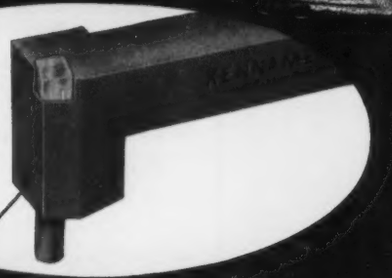
Eligible for the two hours a week for ten weeks courses are truck owners, maintenance superintendents, shop foremen, garage or service mechanics and those in allied occupations.

If you want FREEDOM...

from Unreliable Tooling

from Cheap Money

USE



DEMAND

KENNAMETAL

GOLD COIN STANDARD

Unreliable tools—like cheap money—do not give full value, regardless of their price. The loss due to their unsoundness extends far beyond their own cost—lost man hours, excessive machine downtime, wasted materials.

Kennametal Tooling gives you:

- *FREEDOM to plan a production schedule and maintain it—getting the greatest benefits from skilled men and good machines.*
- *FREEDOM to machine iron castings having hard, burned, or sandy spots, at high speed—thus saving time and materials.*
- *FREEDOM to machine hard steel—up to 501 Brinell—at high speed, without re-annealing and heat treating.*
- *FREEDOM from experimentation—experienced Kennametal tool engineers can recommend the proper tooling for best results on your jobs.*
- *FREEDOM from guesswork—our complete and accurate Catalog makes it easy to order tools for specific jobs.*

Cheap money—like unreliable tools—does not give full value. The consequences of cheap money extend far beyond the demoralizing current effects—spiraling prices, exorbitant taxes, financial insecurity. Ultimate loss of personal liberty, and absolute abrogation of the individual's property rights are inevitable.

Cheap money is the result of the American citizen's inability to control the public purse by demanding and receiving gold in exchange for paper money. Return to the Gold Coin Standard gives you:

- *FREEDOM from excessive taxes and wild spending of your money by government.*
- *FREEDOM from unfair competition subsidized by government loans out of your tax money.*
- *FREEDOM to keep what you earn and spend it as you please.*
- *FREEDOM to save with assurance that your savings are secure.*
- *FREEDOM from economic conditions unfavorable to enterprise and initiative.*
- *FREEDOM to help check the stealthy advance of Socialism, whose deadly weapon is fiat money.*

YOU GET MORE from Less Kennametal

Ask our representatives to demonstrate Kennametal . . . the tooling that reduces costs and increases productivity.

KENNAMETAL

SUPERIOR CEMENTED CARBIDES

KENNAMETAL Inc., LATROBE, PA.

YOU GET LESS from More paper money

Ask your Congressman if he is for or against the Reed Bill HR3262. You and other voters must know.

COULD ANYTHING BE MORE CONVINCING THAN YOUR OWN EXPERIENCE?
Then give HERC-ALLOY the toughest chain job in your plant. Our asking for this test reflects the confidence given us by HERC-ALLOY service records from industry's leading plants.
HERC-ALLOY
STEEL CHAIN

HERC-ALLOY is America's ***first alloy*** steel chain. For slings or other applications HERC-ALLOY Chain will prove that efficiency, safety and economy can go hand-in-hand.

COLUMBUS McKINNON
CHAIN CORPORATION

(Affiliated with Chisholm-Moore Hoist Corporation)

GENERAL OFFICES AND FACTORIES: TONAWANDA, N. Y.

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Nash Rambler Test Market Hinted as Southern California

Los Angeles—Indicating one of the major test markets for the new low-priced Nash Rambler will be on the West Coast, in the southern California area, Nash Motors has announced that it will begin assembly-line production of the car in its nearby El Segundo plant about May 15.

Nash Motors is spending $5 million in a building and expansion program to increase production of automobiles at its plants in Kenosha, Wis., and here. The changes in the Kenosha plant will be completed ahead of those here.

Made in Milwaukee

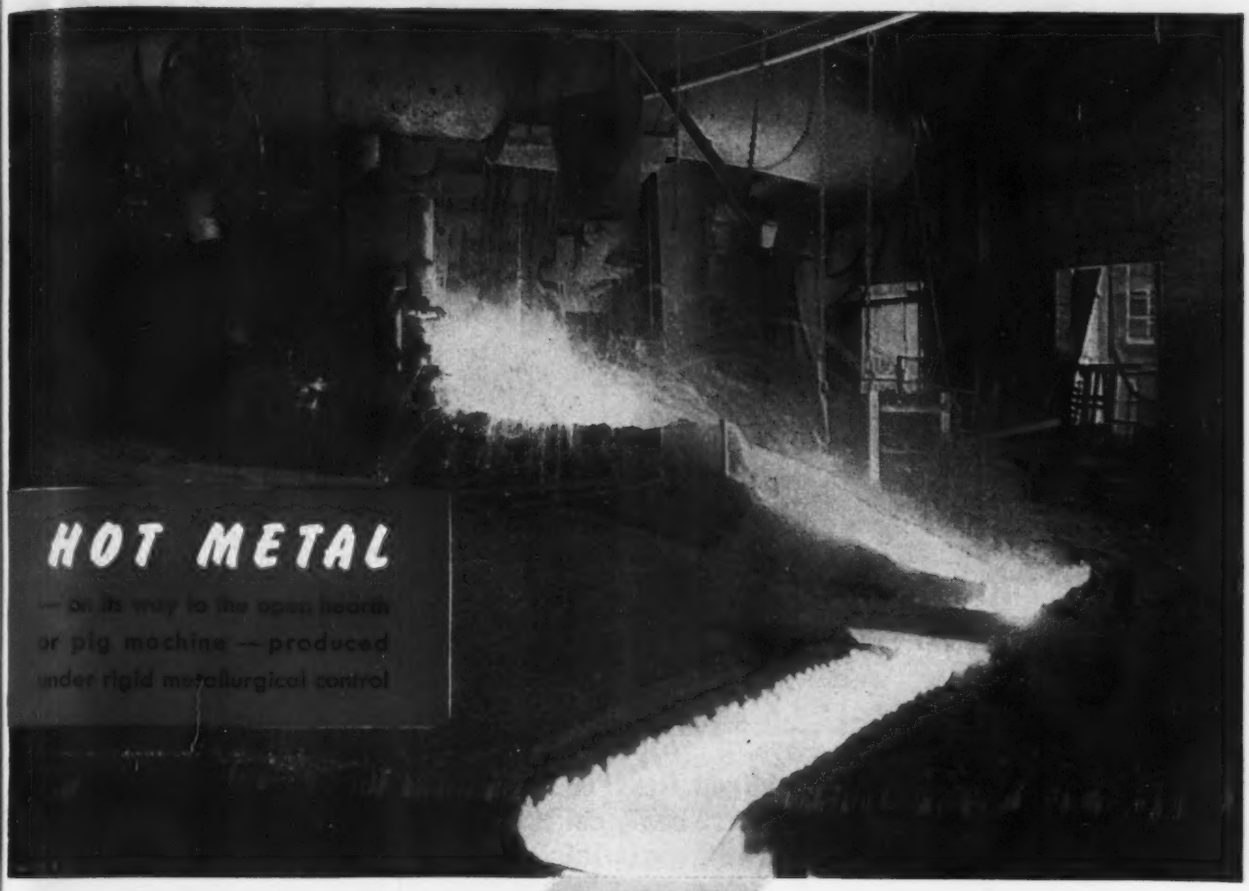
Ramblers designated for here now are being completed at the company's Milwaukee body plant, according to R. A. DeVlieg, vice-president in charge of manufacturing for the Nash-Kelvinator Corp. Mr. DeVlieg was here for an inspection of California facilities under the supervision of Campbell Wood, works manager.

Almost all who have aspired to produce a small car for the low-priced field have eyed the southern California market eagerly. Davis and several other small cars contemplated were turned out in sample numbers here but never produced in volume.

Small European cars have sold well in this market with some even being purchased in fleets to form clubs of owners of particular type autos. Daily car production at the Nash plant here now averages about 80 cars.

Luscome Production to Reopen

Dallas—Production will resume at the Luscome Airplane Corp. factory near Garland, Tex., in the near future. Reactivation follows Luscome reorganization by members of the Texas Engineering and Mfg. Co., purchasers of 85 pct from the former Luscome president. The plant will make light military liaison, crop dusting, and personal use planes, and spare parts for the Luscome Silvaires, manufactured in previous years.



CAREFUL CONTROL—
Here and Everywhere—

—makes Wisconsin Steel products dependable. From blast furnace to finished product, by means of metallurgical control in the hands of competent steelmen, our customers are supplied with a quality product, made to their specifications. In addition, through extensive production and planning control we meet our commitments.

When steel is the article, you can depend on Wisconsin for the best. Our sales and metallurgical staffs are always ready to serve you.

WISCONSIN STEEL COMPANY, Affiliate of
INTERNATIONAL HARVESTER COMPANY
180 North Michigan Avenue • Chicago 1, Illinois

WISCONSIN STEEL

New "Packaged Unit" designed for aggregates, coal, coke, ores and other bulk materials

Equally applicable for both small or large scale operations, the new Hewitt-Robins Sectional Belt Conveyor is a packaged unit that can be assembled by your own workmen—and in considerably less time than required for conventional type conveyors.

From the variety of truss sections, head sections and A-frame supports you can select a conveyor system suited to your needs—in length, height, belt width and capacity. And, when you change locations, the conveyor can be disassembled, with sections added or dropped to suit conditions at the new site.

Like all Hewitt-Robins machinery, this new Sectional Belt Conveyor is carefully designed, strongly constructed. It is equipped with world-famous Robins Troughing and Return Idlers with one-shot lubrication. Curved decking protects the return strand of the belt.

And remember, only Hewitt-Robins is able to take single, unified responsibility for a successful Belt Conveyor installation —machinery and belting. For complete information on the new Hewitt-Robins Sectional Belt Conveyor, write today for Bulletin No. 132. Address Robins Conveyors Division, 270 Passaic Avenue, Passaic, N. J.

* * *

HEWITT-ROBINS SECTIONAL BELT CONVEYOR HEAD SECTIONS—3 types of drives to take motors from 2 hp to over 40 hp. Terminal pulleys (both head and tail) are solid welded steel with cast iron hubs.

TRUSS SECTIONS—2 designs—24" deep in lengths of 6'6", 15'6", 18'6", and 21'6"; 42" deep for greater spans. Side members all-welded construction; diagonal bracing members have jig-drilled holes for quick field assembly.

BENT SUPPORTS—A-frames are available in complete range from 4' to 50' deep—easily erected.

BELT WIDTHS—18", 24", 30" and 36". Lengths up to belt limitation.

HEWITT-ROBINS

BELT CONVEYORS

HEWITT-ROBINS HR INCORPORATED

BELT CONVEYORS *(belting and machinery)* • BELT AND BUCKET ELEVATORS • CAR SHAKEOUTS
DEWATERIZERS • FEEDERS • FOAM RUBBER PRODUCTS • FOUNDRY SHAKEOUTS
INDUSTRIAL HOSE • MINE CONVEYORS • MOLDED RUBBER GOODS
RUBBERLOKT ROTARY WIRE BRUSHES • SCREEN CLOTH • SKIP HOISTS • STACKERS
TRANSMISSION BELTING • VIBRATING CONVEYORS, FEEDERS AND SCREENS

Aluminum Die Casting Firm Reverses Westward Ho Movement

Los Angeles—While scores of companies are heading West, at least one metals firm is reversing the trend and moving its facilities to Arkansas.

Officials of the company think there may be a few others joining them, judging from inquiries they had concerning their plans.

Freight Charge Motive

E. A. Vermere Co. is scheduled to move its entire aluminum die casting plant to Malvern, Ark., near Hot Springs, about May 1. The firm is medium sized with a $250,000 plant and 35 employees manufacturing plumbers' brass goods and industrial aluminum valves.

"We have several reasons for the move," says E. A. Nagle, manager. "Probably the most important is that we believe we will save considerable in freight charges.

"Much of our market is the East and Midwest territories. Our source of supply for materials is the Reynolds Metals Co. which has a million dollar plant nine miles from Malvern. We save on freight both ways. The Vermere Co. has some West Coast customers, but the bulk of its sales are in the East," he added.

Lower Tax Rate

Other reasons cited by Mr. Nagle for the move include a lower tax rate in Arkansas. There a sales tax will be eliminated for the company and property taxes will be lower, according to the manager.

Mr. Nagle believes that labor efficiency in the Los Angeles area has decreased during the 12 years the firm has been established here. He is taking only five or six of his employees with him, as he believes more efficient semi-skilled labor can be trained quickly in Arkansas.

The lower freight rates and other factors will enable the company to increase its usage from 100,000 lbs of aluminum a month to twice that amount, he predicts.

The move of the entire plant

will cost $50,000. The building to be occupied in tiny Malvern was built by citizens there to attract industry.

With a greater concentration of industry in the Arkansas area, it was indicated that a commodity rate on railroad shipping will be requested.

National Lead Co. Reports Increased Net Income for 1949

New York — Another sales-decreased, earnings-increased paradox was reflected in the annual stockholders report of the National Lead Co. President J. A. Martino said that 1949 net income was $14,749,011 as compared with $13,304,355 earnings in '48. Sales last year totaled $257,599 to $320,457 in 1948.

The sales decline was explained as the result of lowered prices of various commodities and a decrease of physical quantity of goods sold. A major price swing affecting the company in 1949 was the drop from 21½¢ to 12¢ in the price of lead. Mr. Martino also said that there were no work stoppages in '49.

Profits Drop Blamed on Costs

Cleveland—Fault for the fall of earnings in 1949 was placed on increased costs for labor, fuel, supplies, and transportation, and a slackening of demand for basic alkalis early in the year by the Diamond Alkali Co. The firm's annual report showed a net income decline of $3,042,298 in '49 from $5,280,632 in 1948.

Post-war expansion and rehabilitation was virtually completed in 1949 and expenditures thus far totaled $38,483,077. Another $3 million will be spent in 1950.

Chicago ASM Elects Officers

Chicago—At the recent election meeting of the Chicago chapter of the American Society for Metals, W. E. Mahin, of Armour Research Foundation, was voted president; C. T. Prendergast, of the Western Electric Co., vice-chairman; and A. B. Condon, Armstrong Cork Co., secretary-treasurer.

SHENANGO-PENN *Centrifugal* CASTINGS ... KEY TO SAVINGS

220-groove Fourdrinier wire cloth warp roll of alloy iron, shown during and after precision machining and grooving. Shenango-Penn centrifugal casting process gave highly desirable uniformity and extra strength to avoid distortion in service due to weight of roll and tension of warp wires.

NEED ROLLS?

Weigh these money-saving facts!

MORE and more industries and suppliers are turning to Shenango-Penn for rolls and roll assemblies because . . .

1. Shenango-Penn's carefully controlled centrifugal casting process, a natural for tough roll service, assures greater strength and uniformity, exceptionally fine pressure-dense grain, and freedom from blow holes, sand inclusions and other often hidden defects. It means much greater wear-life, less maintenance and replacement, plus ability to take abnormal loads and speeds without risking costly failure.

2. Shenango-Penn has the modern machining and finishing facilities, plus the years of specialized experience in producing quality rolls, that will meet your specifications with over-all precision. You save time and avoid trouble . . . both in installation and during subsequent use.

The big special roll shown and described above is one of the many varieties made by Shenango-Penn. For bulletins, for specific data on rolls or roll assemblies of *any* size or type, ferrous or non-ferrous, write to . . .

SHENANGO-PENN MOLD COMPANY
585 West Third Street • Dover, Ohio
Executive Offices: Pittsburgh, Pa.

SHENANGO (P) PENN

All Bronzes • Monel Metal • Ni-Resist • Mechanite® Metal

OH, WHAT LUCK! IF YOU'D OF LEANED AGAINST ONE OF TH' OLD MACHINES, ONE HALF OF YOU WOULD OF WENT AROUND WITH TH' BELT AN' THE OTHER HALF AROUND IN TH' GEARS!
THAT KID WAS DUMB ENOUGH TO OVER-OIL HIS MACHINE, BUT QUICK-WITTED ENOUGH TO GET TH' BULL'S MIND OFF THAT!
THEY TEACH THAT NOW--PSYCHOLOGY! THEY OUGHTA TEACH ABOUT SOL-SPEEDI-DRI--AN' THERE'D BE NO SPILLS TO HAPPEN!
THE FAST TALKER
COPR. 1950 BY NEA SERVICE, INC. T. M. REG. U. S. PAT. OFF.
J.R.WILLIAMS
SOL·SPEEDI·DRI
SPEEDI-DRI CORP.,
WHEN YOU BUY, BE SURE IT'S
SOL-SPEEDI-DRI
OIL & GREASE ABSORBENT
FREE SAMPLE:

Decade Foundry Pig Iron Use Can Fill a Million Freight Cars

New York—The 3000 foundries of iron and steel companies' 30,000 American customers consumed 54 million tons of blast furnace pig iron in the last decade—enough to cram a million freight cars, said the American Iron and Steel Institute last week.

In the same decade the foundries made 126 million tons of gray iron, malleable and steel castings. Their highest production year was in 1948 when more than 15 million tons of castings were produced for automotive, agricultural machinery, railroad equipment, machine tool, and other industries.

The foundries took about 10 pct of total pig iron production with the balance going to steelmaking furnaces.

ASM Unit Conducts Lectures

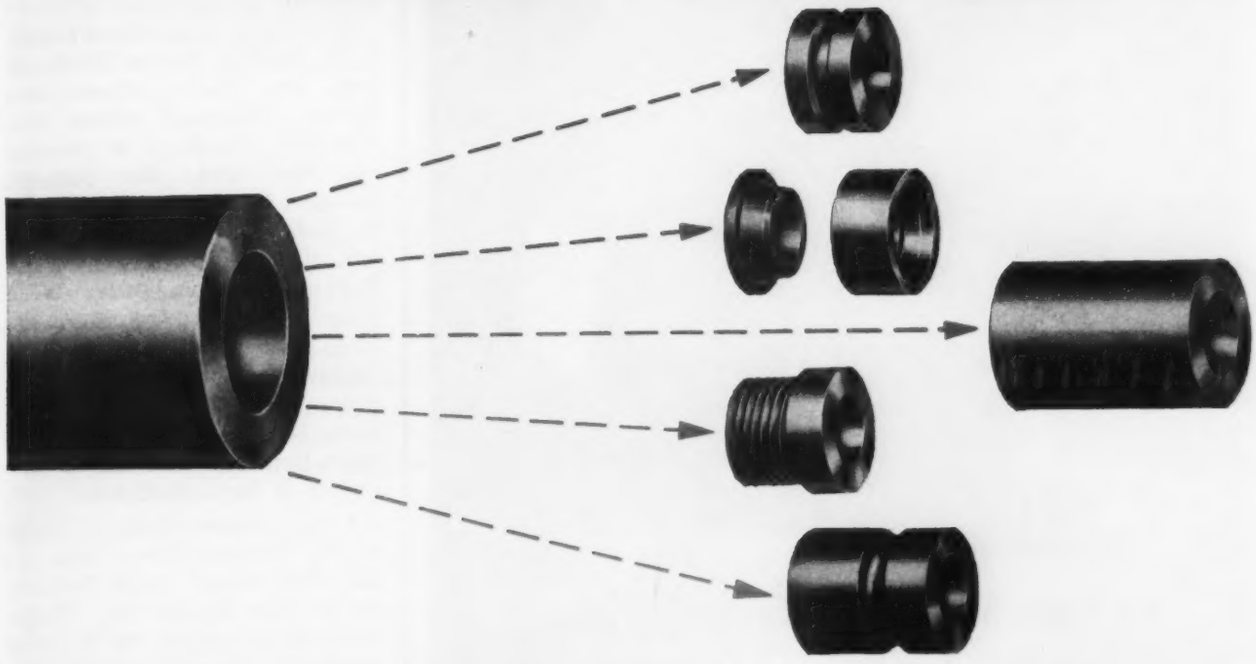
Detroit—A three lecture series on "Temperature Effect on Metals" was held recently by the Detroit chapter of the American Society for Metals. E. J. Ripling, research associate, Case Institute of Technology, spoke on the properties of metals at sub-zero temperatures. James W. Freeman, University of Michigan associate professor, discussed wrought materials designed for elevated temperature service in the range of 500 to 1500°F. Howard C. Cross, supervisor, Metallurgy Div., Battelle Memorial Institute, spoke on cast alloys, refractory metals and ceramics designed for service in the 1200 to 2000°F range.

To Build Furnace in Genoa

Pittsburgh—Rust Furnace Co. will design and engineer a 60-ton per hr double zone continuous billet heating furnace for the Bagnoli Works steel plant, Genoa, Italy, under contract with Morgan Construction Co., Worcester, Mass.

The furnace will serve a rod and merchant mill. Rust will also furnish the combination gas and oil burner equipment.

ROCKRITE TUBING SAVES UP TO 50% OF MACHINING COSTS ON THESE PARTS



You may be saving money by machining parts like those shown here from ordinary mechanical tubing instead of from bar stock or forgings. But with lighter close-tolerance Rockrite Tubing, cost-saving possibilities are still greater! Here's why:

1. Rockrite Tubing is sized by a distinctively different process to much closer tolerances than are practicable by any other method.

2. Machine output has been doubled and machining costs cut in half when Rockrite was substituted for standard mechanical tubing.

ROCKRITE TUBING

LEADS ALL OTHERS IN THESE SAVINGS

- Higher cutting speeds
- Tools last longer between grinds
- Work-surface finishes are better
- Stations on automatics are often released for additional operations
- Extra-long pieces available — less downtime for magazine stocking and fewer scrap ends
- Closer tolerances often eliminate necessity for machining on outside or inside

WANT TO KNOW THE 3 REQUIREMENTS ESSENTIAL FOR TUBE ACCURACY AND COST SAVINGS? Send for new Bulletin being prepared on "behind-the-scenes" facts on close-tolerance Rockrite Tubing. TR-114

TUBE REDUCING CORPORATION · WALLINGTON, NEW JERSEY

● Popular fasteners of great strength and uniform accuracy, Cleveland's High Carbon Cap Screws are made by the Kaufman Process. This famous *Double Extrusion* method assures more uniform dimensions within the tolerance range in the finished product and creates beneficial changes in the steel's grain flow. Complete range of sizes, diameters from ¼" upward. Write for our monthly stock list for quick help in finding fasteners you need.

THE CLEVELAND CAP SCREW COMPANY
2917 East 79th Street — Cleveland 4, Ohio
Warehouses: Chicago, Philadelphia and New York

CLEVELAND *Top Quality* **FASTENERS**

ORIGINATORS OF THE
KAUFMAN DOUBLE EXTRUSION PROCESS
Specialists for more than 30 years in
CAP SCREWS, SET SCREWS, MILLED STUDS
Ask your jobber for Cleveland Fasteners

Waste Materials Dealers Pick Nonferrous Scrap Advisory Panel

New York—A nonferrous metals scrap advisory panel has been named by the National Assn. of Waste Material Dealers, Inc., to work with the Office of International Trade, it has been announced by Clinton M. White, director.

The following have been named: Louis Gordon, Samuel Gordon & Sons, Inc., Chelsea, Mass.; Paul Herzog, Federated Metals Div., American Smelting & Refining Co., New York; Eric Gumpert, Gumpert Metals Corp., New York; S. Katzman, Associated Metals and Minerals Corp., New York; Milton Levenson, Miles Metal Corp., New York; J. A. Marchant, J. A. Marchant & Co., New York; Archie Rosenthal, Jos. Rosenthal's Sons, Inc., Philadelphia; Leon Rose, Bers & Co., Inc., Philadelphia; Emanel Hettleman, K. Hettleman & Sons, Baltimore.

Other members include: Joseph Viener, Hyman Viener & Sons Co., Inc., Washington; Jacob Feldman, Commercial Metals Co., Dallas, Tex.; Eugene Zack, M. W. Zack Metal Co., Detroit; Sidney Danziger, H. Kramer & Co., New York; Louis Lippa, Apex Smelting Co., Chicago; Philip Scheibner, Associated Iron & Metal Co., Oakland, Calif.; H. Whitney Sall, Berg Metals Corp., Los Angeles; Jules Glant, Pacific Iron & Metal Co., Seattle; Max Lonner, Philipp Bros., Inc., New York, and Mr. White.

Thew Profits Slump, Sales Good

Lorain, Ohio—Production changes in 1949 slowed output and profits for the Thew Shovel Co. but not its net sales. C. B. Smythe, president, disclosed in the annual report that profits were $1,186,139 on sales of $20,533,417, which were the third highest in the firm's history. Profits in 1948 were $3,036,331.

Thew developed in '49 a pipeliner machine used in laying gas and oil transmission lines.

Urges Soft Coal Industry Control Agency Similar to ICC

Washington—A proposal that a new federal commission be set up to regulate the soft coal industry in much the same way that the Interstate Commerce Commission regulates the railroads was made in Congress recently.

Representative Cavalcante, D., Pa., who serves also as an official of the United Mine Workers, is asking the House to set up a 7-man federal commission to fix coal prices, set standards of production, and designate safety standards.

Two Types of Taxes

In addition to administering tight production and marketing controls, the commission would levy and collect federal taxes on every ton of bituminous coal produced. There would be 2 types of taxes, Mr. Cavalcante says: (1) an excise tax of 1 cent per ton, plus (2) an excise tax of 19½ pct of the sale price at the mine or the "fair market value" of the coal. Taxes are to be paid by the producers.

It is unlikely that Congress will give serious consideration to Mr. Cavalcante's proposal this year. The House Ways and Means Committee, which was assigned the job of studying his bill, will continue to be fully occupied until early summer with legislation to reduce existing excises. The anticipated adjournment of both houses of Congress by July will preclude any further consideration of the Pennsylvanian's measure until next year —or until the next coal crisis.

Trucks to Get Gyrol Drive

Detroit — Reduction of driver fatigue by minimizing gear shifting and wheel spin is the aim of introducing gyrol fluid drive to "job-rated" vehicles of Chrysler Corp.'s Dodge Div. Fluid drive will be installed in vehicles with a weight range of from 4250 to 10,000 lbs.

Dodge claims that the drive proved successful in their Route-Van, a delivery truck first offered in 1948.

Did you know that SHIMS can be MADE ADJUSTABLE?

...to cut machining costs
...to save assembly time

Laminated shims, stamped from sheets of ***LAMINUM****, are **adjustable.** Laminations of .002 or .003 inch brass or steel simply p-e-e-l off with a penknife, right at the job!

HERE ARE THE ADVANTAGES:

1. No more filing or precision machining or grinding. Laminated shims can take care of increased component tolerances.
2. No fumbling or counting loose shims. The pack is *bonded* together although it peels easily.
3. No dirt, oil, grease between shim layers. Shim is always uniform in gauge, clean and smooth as glass.
4. Actually less compressible than stacked or one-piece shims.
5. No standby lathe or operator—no new skill required.
6. Can be fitted with babbitted lugs to prevent oil or pressure loss.

FOR PRECISION ADJUSTMENT OF SPLIT BEARINGS, GEAR MESH, END-PLAY—ACCURATE SPACING OF MACHINERY COMPONENTS.

Send today for our new data file with specifications, design factors and applications. Sample of ***LAMINUM*** included.

SEE OUR CATALOG IN SWEET'S FILE

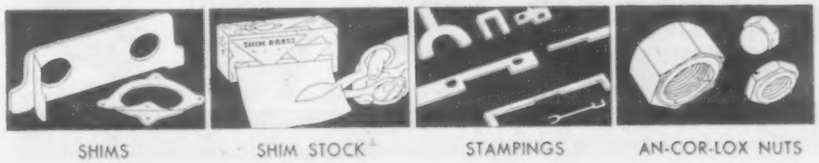
STAMPING • GRINDING METALWORKING SERVICES

Press capacity to 100 tons, 24 inches square, shallow draw. Special equipment and variety of dies can eliminate die-making for short runs. Wide stock of materials. Let us quote on your *difficult* jobs.

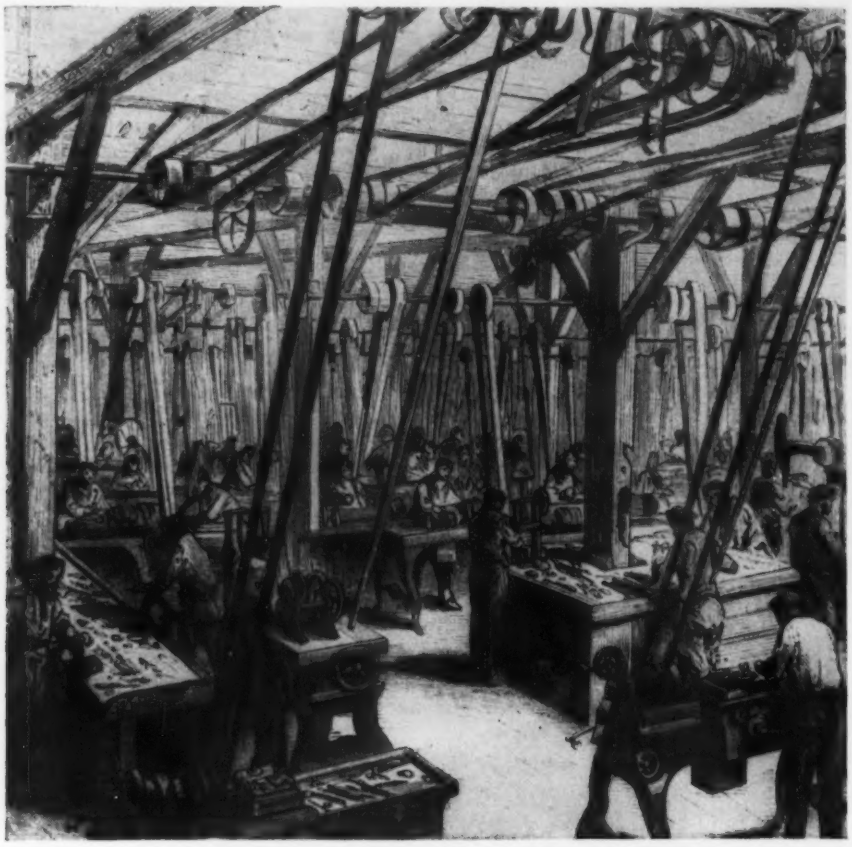
* ***LAMINUM*** (Reg. U. S. Pat. Off.) shims are solidly bonded units made up of .002 or .003 inch brass or steel laminations with a microscopic layer of metallic binder. Cut to your exact specifications.

LAMINUM
THE SOLID SHIM THAT peels FOR ADJUSTMENT

LAMINATED SHIM COMPANY, Inc.
3204 Union Street Glenbrook, Conn.



SHIMS SHIM STOCK STAMPINGS AN-COR-LOX NUTS



The Bettmann Archive

horsepower via horsehide

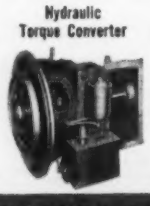
Manufacturing took an important step forward—away from the age of handcraft—when some "production" genius learned that he could harness one power source and put many machines to work with pulleys and belts such as these.

But in many plants, this "horsepower via horsehide" method has given way to individual motors on each machine, as machinery has become larger, more productive, more efficient.

For today's manufacturers demand *positive* control of horsepower . . . the most practical means of applying horsepower to every specific job.

For 31 years the Twin Disc Clutch Company has pioneered the development of a host of devices for smooth power transmission . . . has played an important part in this power revolution. That's why you'll find the name Twin Disc known wherever power is applied—in the construction, lumber, petroleum, farm equipment, marine and machine tool fields. TWIN DISC CLUTCH COMPANY, Racine, Wisconsin (Hydraulic Division, Rockford, Illinois).

TWIN DISC
CLUTCHES AND HYDRAULIC DRIVES



SPECIALISTS IN INDUSTRIAL CLUTCHES SINCE 1918

Twin Coach Offers New High Compression Propane Fuel Buses

Kent, Ohio—A line of seven standard transit buses using 125 octane fuel in Fageol 10-to-1 compression ratio engines was introduced by the Twin Coach Co. F. R. Fageol, chairman, predicted that propane will soon be furnishing power for an increasing number of city transit systems. He said that three coaches had been ordered already.

Designed six years ago in anticipation of today's high octane fuels, the Twin Coach engine can operate at a 14-to-1 ratio if wanted. The firm is also producing a conversion kit to transform post-war coaches to propane consumers.

Pullman Co. Income Drops

Chicago—Net income of Pullman, Inc., dropped to $2.42 a share in 1949 from $3.18 a share in 1948, the company's annual report revealed.

The drop reflected a decline in orders for new freight cars which forced several plants of the Pullman-Standard subsidiary to curtail operations in the second half of the past year. Activities of the M. W. Kellogg Co. subsidiary were also on a somewhat reduced scale in 1949, the report stated, primarily because of a decrease in domestic oil refinery construction.

Sufficient orders to permit reopening of two of the company's three freight car plants are now on hand, the report stated, and increased sales may result if a proposed car-leasing plan continues to develop.

Miners Leave Depressed Areas

Salt Lake City—Defeat of the mine aid bill in the House of Representatives dashed cold water on whatever surviving hopes there were of early reopening of closed nonferrous metal mines. Experienced metal miners are moving from the depressed districts to other jobs—some in coal mining and others to larger mines.

CUMBERLAND GROUND SHAFTS

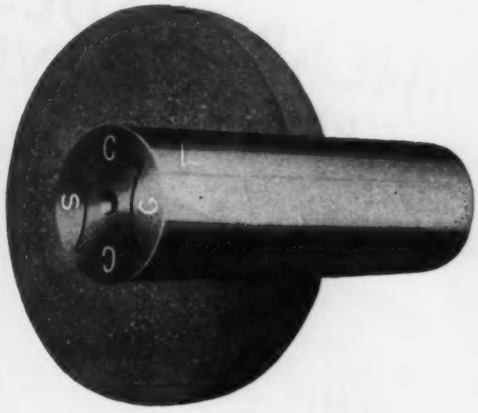
We manufacture 8" diameter, 7½", 7", 6½", 6" and intermediate sizes down to and including 1⅛".

ON THE WEST VIRGINIA SHORE, OVERLOOKING THE POTOMAC RIVER, STANDS THE JAMES RUMSEY MONUMENT

The first practical steamboat in the world was run on the Potomac River a few miles below Cumberland, Maryland.

GEORGE WASHINGTON said in his dairy, under date of September 6, 1784: "Remained at Bath all day and was showed the Model of a boat constructed by the ingenious Mr. Rumsey, for ascending rapid currents by mechanism; the principles of this were not only shown, and fully explained to me, but to my very great satisfaction, exhibited in practice in private under the injunction of secrecy——".

At a later date GEORGE WASHINGTON said in his dairy: "Spent the afternoon with Mr. Rumsey and then Alexander Hamilton and I rode on to Cumberland, Maryland."



Symbol of Quality

Approximately 100 years after the exhibit of this steamboat, Cumberland began grinding shafts. They found through experience this was the best method by which accurate steel shafts could be produced. These shafts are so carefully ground that they are adapted for mass production where gears, pulleys, sprockets and bearings must slide on the shafts without delay due to filing or fitting.

IMMEDIATE SHAFTS

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Baltimore, Maryland—Addison Clarke & Bro.
Boston, Mass.—Hawkridge Brothers Company
Boston, Mass—Brown-Wales Company
Bridgeport, Conn.—Hunter & Havens, Inc.
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Montreal, Can.—Drummond, McCall & Co., Ltd.
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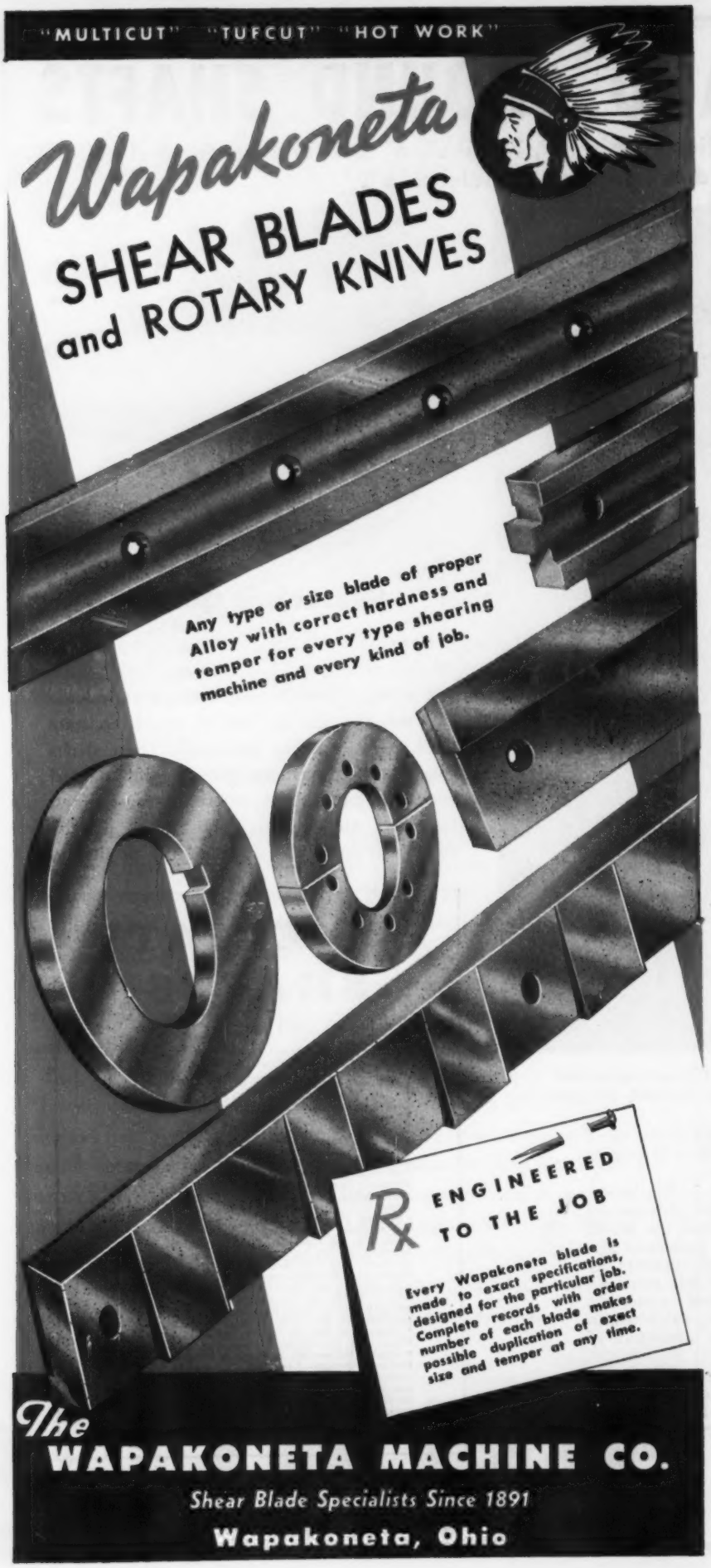
Providence, R. I.—Congdon & Carpenter Co.
San Francisco, Calif.—Link-Belt Co., Pacific Div.
Seattle, Wash.—Link-Belt Co., Pacific Div.
Spokane, Wash.—Link-Belt Co., Pacific Div.
Toronto, Canada—Drummond, McCall & Co., Ltd.
Worcester, Mass.—Pratt & Inman

CUMBERLAND STEEL COMPANY **CUMBERLAND, MARYLAND, U. S. A.**
ESTABLISHED 1845 INCORPORATED 1892


"MULTICUT" "TUFCUT" "HOT WORK"
Wapakoneta
SHEAR BLADES
and ROTARY KNIVES
Any type or size blade of proper Alloy with correct hardness and temper for every type shearing machine and every kind of job.
Rx ENGINEERED TO THE JOB
Every Wapakoneta blade is made to exact specifications, designed for the particular job. Complete records with order number of each blade makes possible duplication of exact size and temper at any time.
The WAPAKONETA MACHINE CO.
Shear Blade Specialists Since 1891
Wapakoneta, Ohio

Westinghouse Forum Scheduled

Pittsburgh—Approximately 175 engineers and machine tool builders are expected at the annual Machine Tool Electrification Forum to be held by Westinghouse Electric Corp. at Buffalo, April 25 and 26. J. J. Smith, Jr., of Westinghouse is general chairman.

Opening day sessions will be held at the Hotel Statler, with meetings scheduled the second day at the Westinghouse plant.

Speakers will include E. K. Morgan and W. G. Wigton, Giddings and Lewis Co., Fond du Lac, Wis.; Ralph Shuman, Warner and Swasey Co., Cleveland; L. W. Scott Alter, American Tool Works, Cincinnati; J. M. Morgan, Jr., Cincinnati Milling Machine Co., Cincinnati; Nels Bashor, W. F. and John Barnes Co., Rockford, Ill.; R. C. Montanus, Springfield Machine Tool Co., Springfield, Ohio; O. G. Rutemiller, Morton Manufacturing Co., Muskegon Heights, Mich.; and E. B. Ankenmann and F. D. Snyder, Westinghouse.

Holds Regional Sales Meetings

Cleveland—Regional sales meeting of dealers, distributors, and salesmen to learn the latest on company policies, programs, and manufacturing developments were being held in the main Towmotor Corp. plant here.

Towmotor, manufacturer of fork lift trucks, tractors, and materials handling accessories, has already staged meetings in New York, Cleveland, and Chicago. Others were scheduled for San Francisco, Apr. 17-18, and New Orleans, May 18-19.

Williams Steel Opens Warehouse

Milwaukee—A new warehouse and office has been opened by the Williams Steel and Supply Co. It includes increased storage facilities and fabricating equipment. The firm handles hot-rolled products, structurals, and reinforcing steel, and will add a line of cold-rolled steel in the near future.

COATED PRODUCTS COMMENTS

Another way to cut costs

Selecting an abrasive belt that turns out more pieces at a lower cost per unit has provided important savings for one concern after another. The belt is CARBORUNDUM's Industrial Cloth Belt designed to grind and polish both high and low tensile strength metals. Used on equipment ranging from backstand belt grinders to platen type belt sanders, these belts have increased production by as much as 150%—reduced unit cost by even more worthwhile amounts.

This exceptional performance is due to a sharp fast cutting action that stands up under severe grinding and polishing operations. It means more units of production per hour, for longer operating periods. We'd like to back up these claims by showing you the hundreds of cases where CARBORUNDUM's Industrial Cloth Belts provided one answer to today's high cost production conditions. Coated Products Division, The Carborundum Company, Niagara Falls, New York.

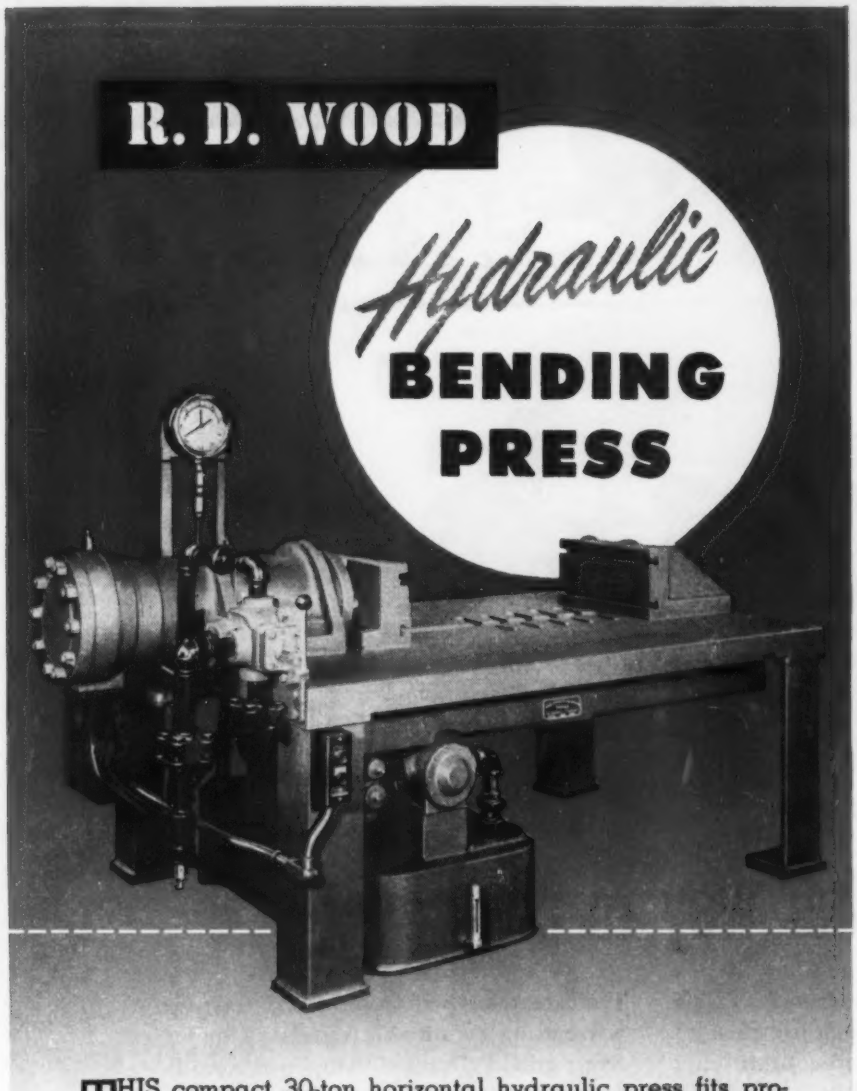
COATED ABRASIVES BY

CARBORUNDUM

TRADE MARK

Making ALL abrasive products...
to give you the proper ONE

"Carborundum" is a registered trademark which indicates manufacture by The Carborundum Company



THIS compact 30-ton horizontal hydraulic press fits productively into general shop use—in the bending and straightening of rods, bars, light structural sections, and for similar work. Self-contained, it is well designed and constructed, with a smooth tool finished 3′ x 4′ steel work table, and 9″ x 18″ ram and resistance heads, machine tee slotted for dies or bending forms. Distance between rams is adjustable in 4″ increments from 1′ to 3′. The press stands 2½′ above the floor at the work table, and occupies an approximate floor space of 7′3″ x 4′6″. Higher capacities and various size tables can be furnished. Write, without obligation, to R. D. Wood Company for additional information.

HYDRAULIC PRESSES AND VALVES FOR [illegible] PURPOSE • ACCUMULATORS • ALLEVIATORS • INTENSIFIERS

EST. 1803

R. D. Wood Company

Industrial Expansion Rate Soars

Chicago — Industrial expansion and improvement expenditures are proceeding at record-breaking post-war levels, according to the Association of Commerce and Industry. During March, a total of 32 firms announced plant outlays amounting to more than $17.6 million, making the March and first quarter totals the highest of any year since the war.

Among the firms announcing plant acquisitions or building plans were four planning production in the Chicago area for the first time. Largest of these is the Caterpillar Tractor Co., which announced a large road machinery plant to be built near Joliet, Ill.

At the same time, nearly all major business indicators showed seasonal declines during February. Construction awards, however, were higher in number.

Develop Underground Ore Mines

Cleveland—Net earnings of the Cleveland Cliffs Iron Co. were $8,646,199 in 1949 on sales of $75,688,744. This compares with net earnings of $8,845,988 and sales of $83,129,972 for 1948. Shipments of iron ore in '49 from Cleveland Cliffs mines and affiliates totaled 9,009,394 tons.

The company has a 50 pct interest in the Mather mine of the Negaune Mine Co. "B" shaft is now being developed and it is expected that the mine will produce a substantial tonnage by 1952. When completed it will be the largest underground mine in the world, it is believed.

Mercury to Pace Racers

Detroit—A mate to the Mercury convertible standard engine which powered the car winning the 750-mill Grand Canyon run will pace the glamour vehicles of the automotive kingdom at the 500-mile race at Indianapolis on May 30. Benson Ford, vice-president of Ford and general manager of the Lincoln-Mercury Div., will drive. Wilbur Shaw will be a passenger.

Briefs and Bulletins

handicap race—Midwest steel supply still lags behind demand. Sheets are the most desired item. All flat rolled products including light and heavy plate are in a state of shortage. Plate demand has risen considerably. Bar mills are barraged with orders and are rummaging in warehouses to fill them. Demand for alloy bars is quickening. An adequate linepipe supply is in the distant future and some predict that this pipe business will remain strong for another 3 years. Running contrary to the tide, some specialty items, rails and structural shapes are not moving as fast as before.

waxing optimistic—The hot-rolled bar business continues strong and some producers are seeing bright visions of a record month. A sour note into their glee is interjected by more objective parties who feel that a record month might be possible if the bar mills could get all the steel they need. One large producer noted that some available capacity is idle because of this reason. Deliveries are not promised on an individual basis, as the mills are working on allotment. The order books are filled through June and demand is tighter in the Midwest than in the East.

new tin capacity—Carnegie-Illinois Steel Corp. will install a fourth electrolytic tinning line at its Gary sheet and tin mill. When in operation by the end of this year the mill will add 120,000 tons annually to the plant's 612,000 ton capacity. A continuous annealing furnace, first of its kind in any Carnegie-Illinois plant, also will be installed at Gary to tie in with tinplate production. Simultaneous improvements to the 44-in. slabbing mill at the south Chicago plant will increase capacity of this mill by 150,000 tons to approximately 1,560,000 tons annually and provide additional slabs for the Gary sheet and tin mill.

great lengths—The flat rolled steel inventories of a large electrical equipment producer are very anaemic. So desperately is this firm trying to build up its stocks that it is paying $40 above the market for hot-rolled sheets from marginal producers operating outmoded hand mills.

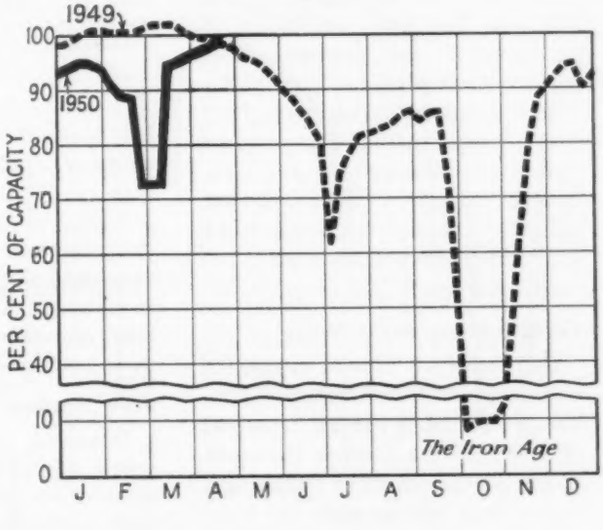
demand continues—Eastern pipe jobbers are easing off some in buying pressure. Observers see the possibility of inventory readjustment now that stocks have been built. With the building season at hand, there is no expectation of a lower rate of consumer demand.

another step — The New England Council took another long step in their efforts to obtain a steel mill this week by activating the New England Steel Development Corp. The corporation, chartered Jan. 6, is authorized to: (1) Make additional New England steel market studies; (2) Determine availability and cost of raw materials; (3) Make contracts and agreements with potential customers and suppliers; (4) Select a plant site; (5) Plan and design the plant and equipment; (6) Make financing plans; and (7) Make arrangements with local, state and Federal governments. This corporation is expected to exist for about a year, at which time it will be replaced by the New England Steel Corp., which will be the operating corporation.

busy signals—Demand for pipe products in the Pittsburgh area continues unabated and producers are not able to keep abreast of incoming orders. On lapweld, business is expected to be good through the third quarter in all sizes excepting 2-4 in., which are available through July delivery.

conversion buying—Many steel users are still enmeshed in conversion buying. Most of them are buying conversion to cover July requirements, and one Midwest consumer is buying into August. Some Midwest firms are probing into the East for steel and paying premium prices.

Steel Operations



District Operating Rates—Per Cent of Capacity

Week of	Pittsburgh	Chicago	Youngstown	Philadelphia	Cleveland	Buffalo	Wheeling	South	Detroit	West	Ohio River	St. Louis	East	Aggregate
April 9	101.0*	103.0*	90.0*	84.0	99.0*	104.0	104.0	104.0	106.0*	95.5	87.0	84.3	119.0	98.0
April 16	101.0	103.0	90.5	84.0	98.0	104.0	106.0	104.0	103.0	97.0	87.0	79.8	127.0	100.0

* Revised.

Nonferrous Metals OUTLOOK

Market Activities

by John Anthony

Copper buyers frantically try to place orders . . . March deliveries set record . . . Price advance may be in prospect . . . Zinc buying still very heavy . . . Lead market improves

New York — Copper demand seems to be constantly increasing. For a day or two last week, it appeared that some buyers were hesitant about the market outlook once the Chile strike was ended. But this has gone overboard in the scramble for deliveries. Buyers are trying to get nearby delivery without any success. They have been putting pressure on sellers to open up for June delivery. Fabricators, who had been judged by some to be carrying unusually heavy inventories, are asking for early delivery.

Tariff Affects Price Move

Deliveries of refined copper to customers in March reached 123,030 short tons, a record figure, as reported by the Copper Institute. March deliveries were 10,257 tons higher than in February, but average production per day was down by 59 tons from February's record daily rate. March deliveries were almost 10,000 tons higher than refined production, resulting in a total drop of 17,200 tons in refined stocks. Industry stocks of refined copper at the end of March virtually reached bottom at 60,276 tons. Domestic production of primary crude copper in March was up 9500 tons to 78,561 tons.

With this background, and the current heavy copper demand, speculation on a price increase is mounting. The development is tied up with the coming battle over continued tariff suspension.

Zinc Market Strong

Domestic producers will make every effort to avoid an upward price move until the tariff question is clarified. But the strength of the market is such that an increase by any major factor would be sufficient to force all sellers up. It is significant that the president of Chile should choose to visit the United States at this time when the tariff question, so vital to the economy of Chile, should be under discussion.

Buying of zinc is going on at an active rate. The market is very strong and there is every possibility of a price advance in the near future. Demand from die casters is the most pressing, with galvanizing grade also being sought actively.

The lead market undertone is firm. Some buyers have begun to take lead at a fixed price, an action that would not have been taken a few weeks ago. Smelters are still burdened with heavy inventories, but consumers' stocks are low.

Small-lot buyers here were seeking tin. Early this week added strength in the Singapore market brought the price of prompt at New York to 77½¢, up 1¼¢ in a week.

NONFERROUS METALS PRICES

	Apr. 12	Apr. 13	Apr. 14	Apr. 15	Apr. 17	Apr. 18
Copper, electro, Conn.	18.50	18.50	18.50	18.50	18.50	18.50
Copper, Lake, Conn.	18.625	18.625	18.625	18.625	18.625	18.625
Tin, Straits, New York	76.50	76.50	76.75	....	77.50	*77.00
Zinc, East St. Louis	10.50	10.50	10.50	10.50	10.50	10.50
Lead, St. Louis	10.30	10.30	10.30	10.30	10.30	10.30

Note: Quotations are going prices.
* Tentative.

MILL PRODUCTS

Aluminum

(Base prices, cents per pound, base 30,000 lb, f.o.b. shipping point, freight allowed)

Flat Sheet: 0.188 in., 2S, 3S, 26.9¢; 4S, 61S-O, 28.8¢; 52S, 30.9¢; 24S-O, 24S-OAL, 29.8¢; 75S-O, 75S-OAL, 36.3¢; 0.081 in., 2S, 3S, 27.9¢; 4S, 61S-O, 30.2¢; 52S, 32.3¢; 24S-O, 24S-OAL, 30.9¢; 75S-O, 75S-OAL, 38¢; 0.032 in., 2S, 3S, 29.5¢; 4S, 61S-O, 33.5¢; 52S, 36.2¢; 24S-O, 24S-OAL, 37.9¢; 75S-O, 75S-OAL, 47.6¢.

Plate: ¼ in., and heavier: 2S, 3S, F, 23.8¢; 43-F, 26¢; 52S-F, 27.1¢; 61S-O, 26.6¢; 24S-F, 24S-FAL, 27.1¢; 75S-F, 75S-FAL, 33.9¢.

Extruded Solid Shapes: Shape factors 1 to 4, 33.6¢ to 64¢; 11 to 13, 34.6¢ to 76¢; 23 to 25, 36.7¢ to $1.05; 35 to 37, 44¢ to $1.53; 47 to 49, 63.5¢ to $2.20.

Rod, Rolled: 1.5 to 4.5 in., 2S-F, 3S-F, 34¢ to 30.5¢; Cold-finished, 0.375 to 3 in., 2S, 3S, 36.5¢ to 32¢.

Screw Machine Stock: Rounds, 11S-T3, R317-T4; ⅛ to 11/32 in., 49¢ to 38¢; ⅜ to 1½ in., 37.5¢ to 35.5¢; 1 9/16 to 3 in., 35.5¢ to 32.5¢; 17S-T4 lower by 1¢ per lb. Base 5000 lb.

Drawn Wire: Coiled, 0.051 to 0.374 in.; 2S, 36¢ to 26.5¢; 52S, 44¢ to 32¢; 56S, 47¢ to 38.5¢; 17S-T4, 50¢ to 34.5¢; 61S-T4, 44.5¢ to 34¢; 75-T-6, 76¢ to 55¢.

Magnesium

(Cents per lb, f.o.b. mill, freight allowed)

Sheets and Plate: Ma, FSa, ¼ in., 54¢-56¢; 0.188 in., 56¢-58¢; B & S gage 8, 58¢-60¢; 10, 59¢-61¢; 12, 63¢-65¢; 14, 69¢-74¢; 16, 76¢-81¢; 18, 84¢-89¢; 20, 96¢-$1.01; 22, $1.22-$1.31; 24, $1.62-$1.75. Specification grade higher. Base: 30,000 lb.

Extruded Round Rod: M, diam in., ¼ to 0.311, 58¢; ½ to ¾, 46¢; 1¼ to 1.749, 43¢; 2½ to 5, 41¢. Other alloys higher. Base: Up to ⅜ in. diam., 10,000 lb; ¾ in. to 1¾ in., 20,000 lb; 1¾ in. and larger, 30,000 lb.

Extruded Square, Hex. Bar: M, size across flats, in., ¼ to 0.311, 61¢; ½ to 0.749, 48¢; 1¼ to 1.749, 44¢; 2½ to 4, 42¢. Other alloys higher. Base: Up to ¾ in. diam, 10,000 lb; ¾ in. to 1¾ in., 20,000 lb; 1¾ in. and larger, 30,000 lb.

Extruded Solid Shapes, Rectangle: M, in weight per ft, for perimeters of less than size indicated, 0.10 to 0.11 lb per ft, per. up to 3.5 in., 55¢ 0.22 to 0.25 lb per ft, per. up to 5.9 in., 51¢; 0.50 to 0.59 lb per ft, per. up to 8.6 in., 47¢; 1.8 to 2.59 lb per ft, per. up to 19.5 in., 44¢; 4 to 6 lb per ft, per. up to 28 in., 43¢. Other alloys higher. Base, in weight per ft of shape: Up to ½ lb, 10,000 lb; ½ lb to 1.80 lb, 20,000 lb; 1.80 lb and heavier, 30,000 lb.

Extruded Round Tubing: M, wall thickness, outside diam. in., 0.049 to 0.057, ¼ to 5/16, $1.14; 5/16 to ¾, $1.02; ½ to ⅝, 76¢; 1 to 2 in., 65¢; 0.065 to 0.082, ⅜ to 7/16, 85¢; ⅝ to ¾, 62¢; 1 to 2 in., 57¢; 0.165 to 0.219, ⅝ to ¾, 54.5¢; 1 to 2 in., 53¢; 3 to 4 in., 49¢. Other alloys higher. Base, OD in in.,: Up to 1½ in., 10,000 lb; 1½ in. to 3 in., 20,000 lb; 3 in. and larger, 30,000 lb.

Nickel and Monel

(Base prices, cents per lb, f.o.b. mill)

	Nickel	Monel
Sheets, cold-rolled	60	47
Strip, cold-rolled	66	50
Rods and bars	56	45
Angles, hot-rolled	56	45
Plates	58	46
Seamless tubes	89	80
Shot and blocks	..	40

Copper, Brass, Bronze

(Cents per lb, freight prepaid on 200 lb)

	Sheets	Rods	Extruded Shapes
Copper	32.18	....	31.78
Copper, h-r	....	28.03	....
Copper, drawn	....	29.28	....
Low brass	30.12	29.81	33.03*
Yellow brass	28.69	28.38	31.70*
Red brass	30.60	30.29	33.51*
Naval brass	33.51	27.57	28.82
Leaded brass	....	23.19	27.22
Com'l bronze	31.61	31.30	34.27*
Manganese bronze	37.01	30.92	32.42
Phosphor bronze	50.90	51.15	....
Muntz metal	31.58	27.14	28.39
Everdur, Herculoy, Olympic, etc.	37.19	36.14	....
Nickel silver 10 pct	39.66	41.87	46.80
Arch. bronze	....	....	27.22

*Seamless tubing.

PRIMARY METALS

(Cents per lb, unless otherwise noted)

Aluminum, 99+%, 10,000 lb, freight allowed	17.00
Aluminum pig	16.00
Antimony, American, Laredo, Tex.	24.50
Beryllium copper, 3.75-4.25% Be dollars per lb contained Be	$24.50
Beryllium aluminum 5% Be, dollars per lb contained Be	$56.00
Bismuth, ton lots	$2.00
Cadmium, del'd	$2.00
Cobalt, 97-99% (per lb)	$1.80 to $1.87
Copper, electro, Conn. Valley	18.50
Copper, lake, Conn. Valley	18.625
Gold, U. S. Treas., dollars per oz.	$35.00
Indium, 99.8%, dollars per troy oz.	$2.25
Iridium, dollars per troy oz.	$100 to $110
Lead, St. Louis	10.30
Lead, New York	10.50
Magnesium, 99.8+%, f.o.b. Freeport Tex., 10,000 lb	20.50
Magnesium, sticks, 100 to 500 lb	36¢ to 38¢
Mercury, dollars per 76-lb flask f.o.b. New York	$70 to $73
Nickel, electro, f.o.b. New York	42.97
Nickel oxide sinter, f.o.b. copper Cliff, Ont., contained nickel	36.25
Palladium, dollars per troy oz.	$24.00
Platinum, dollars per troy oz.	$66 to $69
Silver, New York, cents per oz.	71.75
Tin, New York	77.00
Zinc, East St. Louis	10.50
Zinc, New York	11.22

REMELTED METALS

Brass Ingot

(Cents per lb delivered, carloads)

85-5-5-5 ingot	
No. 115	17.25-18.25
No. 120	16.75-17.75
No. 123	16.25-17.25
80-10-10 ingot	
No. 305	21.75
No. 315	19.75
88-10-2 ingot	
No. 210	27.75
No. 215	25.25
No. 245	18.75-21.00
Yellow ingot	
No. 405	14.50-16.00
Manganese bronze	
No. 421	20.75

Aluminum Ingot

(Cents per lb, of 30,000 lb)

95-5 aluminum-silicon alloys	
0.30 copper, max.	18.25-18.75
0.60 copper, max.	18.00-18.50
Piston alloys (No 122 type)	16.50-17.00
No. 12 alum. (No. 2 grade)	15.75-16.25
108 alloy	16.50-17.00
195 alloy	17.25-17.75
13 alloy	18.25-18.75
AXS-679	16.75-17.25

Steel deoxidizing aluminum, notch-bar granulated or shot

Grade 1—95-97½%	17.50-18.00
Grade 2—92-95%	16.50-17.00
Grade 3—90-92%	15.50-16.00
Grade 4—85-90%	15.00-15.50

ELECTROPLATING SUPPLIES

Anodes

(Cents per lb, freight allowed, in 500 lb lots)

Copper	
Cast, oval, 15 in. or longer	35½
Electrodeposited	29¾
Rolled, oval, straight, delivered	33
Forged ball anodes	34
Brass, 80-20	
Cast, oval, 15 in. or longer	31
Zinc, oval, 99.886, f.o.b. Detroit	17¼
Ball anodes	16¼
Nickel 99 pct plus	
Cast	59.00
Rolled, depolarized	60.00
Cadmium	$2.15
Silver 999 fine, rolled, 100 oz lots, per troy oz, f.o.b. Bridgeport, Conn.	79½

Chemicals

(Cents per lb, f.o.b. shipping point)

Copper cyanide, 100 lb drum	46½
Copper sulfate, 99.5 crystals, bbl.	12.00
Nickel salts, single or double, 4-100 lb bags, frt allowed	18.00
Nickel chloride, 300 lb bbl	24.50
Silver cyanide, 100 oz lots, per oz	61¼
Sodium cyanide, 96 pct domestic 200 lb drums	19.25
Zinc sulfate, 89 pct granular	7.15
Zinc cyanide, 100 lb drums	38.00

SCRAP METALS

Brass Mill Scrap

(Cents per pound; add ½¢ per lb for shipments of 20,000 to 40,000 lb; add 1¢ for more than 40,000 lb)

	Heavy	Turnings
Copper	15½	14⅜
Yellow brass	12½	11⅜
Red brass	14	13¼
Commercial bronze	14¼	13½
Manganese bronze	12	11¼
Leaded brass rod ends	12¼	....

Custom Smelters' Scrap

(Cents per pound, carload lots, delivered to refinery)

No. 1 copper wire	15.25-15.50
No. 2 copper wire	14.25-14.50
Light copper	13.25-13.50
Refinery brass	14.00*
Radiators	10.00

*Dry copper content.

Ingot Makers' Scrap

(Cents per pound, carload lots, delivered to producer)

No. 1 copper wire	15.25-15.50
No. 2 copper wire	14.25-14.50
Light copper	13.25-13.50
No. 1 composition	12.75
No. 1 comp turnings	12.25
Rolled brass	10.50
Brass pipe	11.00
Radiators	10.00-10.25
Heavy yellow brass	9.75-10.00
Aluminum	
Mixed old cast	9.25- 9.50
Mixed old clips	10.25-10.50
Mixed turnings, dry	9.50
Pots and pans	9.75
Low copper	11.00-11.50

Dealers' Scrap

(Dealers' buying prices, f.o.b. New York in cents per pound)

Copper and Brass	
No. 1 heavy copper and wire	14 —14¼
No. 2 heavy copper and wire	13 —13¼
Light copper	11¾ —12
Auto radiators (unsweated)	8¾ — 9
No. 1 composition	11¼ —11½
No. 1 composition turnings	10¾ —11
Clean red car boxes	9¼ — 9½
Cocks and faucets	9¼ — 9½
Mixed heavy yellow brass	7½ — 7¾
Old rolled brass	8¾ — 9
Brass pipe	9½ —9¾
New soft brass clippings	10½ —11
Brass rod ends	9¾ —10
No. 1 brass rod turnings	9½ — 9¾
Aluminum	
Alum. pistons and struts	4½ — 5
Aluminum crankcases	7 — 7½
2S aluminum clippings	10 —10½
Old sheet and utensils	7 — 7½
Borings and turnings	4
Misc. cast aluminum	7 — 7½
Dural clips (24S)	7 — 7½
Zinc	
New zinc clippings	6¾ — 7¼
Old zinc	4½ — 5
Zinc routings	2¾ — 3¼
Old die cast scrap	3½ — 3¾
Nickel and Monel	
Pure nickel clippings	21 —23
Clean nickel turnings	14 —15
Nickel anodes	20 —22
Nickel rod ends	20 —22
New Monel clippings	12 —14
Clean Monel turnings	8 — 9
Old sheet Monel	10 —12
Old Monel castings	9 —10
Inconel clippings	11 —13
Nickel silver clippings, mixed	8 —10
Nickel silver turninge, mixed	6 — 7
Lead	
Soft scrap, lead	8¼ — 8½
Battery plates (dry)	4¼ — 4½
Magnesium	
Segregated solids	9 —10
Castings	5½ — 6½
Miscellaneous	
Block tin	60 —62
No. 1 pewter	38 —40
No. 1 auto babbitt	35 —37
Mixed common babbitt	8¼ — 8½
Solder joints	11 —11½
Siphon tops	40 —42
Small foundry type	11 —11½
Monotype	10 —10½
Lino. and stereotype	9¼ — 9⅜
Electrotype	8½ — 8½
New type shell cuttings	11⅝ —12
Hand picked type shells	4½ — 5
Lino. and stereo. dross	3⅜ — 4
Electro. dross	2¼ — 2½

MARKETS—PRICES—TRENDS

SCRAP
Iron & Steel

Cast Grades Lead Higher Price Parade

Cast grades took the No. 1 spot on this week's scrap parade. Dull for months despite brisk business in steelmaking grades, the cast market this week is stronger all over the country.

Not all cast prices rose—some of them had already moved last week—but the cast tone was good, for a change. Cast price increases were posted at Philadelphia, Cleveland, Buffalo, New York, Boston, Detroit and Cincinnati.

Despite the restraint being shown by steel company buyers—despite their reluctance to reach to great distances and illogical buying areas—prices of the steelmaking grades are firm to higher. Higher but not runaway prices are still being predicted in some quarters. But things are still a long way from what they were in 1948 when demand teamed with conversion deals, long hauls and cross hauls to rocket prices to dizzy heights.

PITTSBURGH—From all indications, the market is still strong, but the mills were not doing any buying to speak of last week. No. 1 heavy melting continued unchanged at $33, top. No. 2 bundles moved up another $1 to $27. Machine shop turnings advanced $1, and heavy turnings were up $2. Scrap rails advanced 50¢.

CHICAGO—Mills in the Chicago area have not yet come into the market to buy in any sizable quantities. The market remains strong. Broker buying is active. They are buying to cover old orders. In some cases they are paying the same or even more for scrap than they will receive from the consumers. One large scrap purchaser in this area bought shoveling turnings for $22 per gross ton thus raising the price $1. Another recent sale of machine shop turnings brought the price up 50¢ to a top of $19 gross.

PHILADELPHIA—This market is feeling the effects of strength in the Pittsburgh market. Steel grades advanced again last week on new buying by several consumers. The spread widened by 50¢, and No. 2 bundles advanced $1 a ton. Rail specialties were up $1. The increased strength of the market was indicated by the Navy Yard sale. Cast grades shared in the rise, with yard cast and breakable moving up $1. Shipments are heavier. Recent higher prices and the spring weather have begun to increase yard intake. Consumers are taking bundles ton for ton with melting steel.

NEW YORK—Cast price increases featured a strong market here. Most steelmaking activity was based on cleaning up of old orders though new business was expected soon. So far, despite conversion demand, there has been little or no cross hauling and market raiding that upset prices in 1948. Cast prices quoted here are for carloads; truckers are still paying more for small lots for Jersey foundries.

DETROIT—Continuing pressures to meet contractual obligations under conversion agreements are sustaining an active scrap market in Detroit. Based on reported sales of representative tonnages by dealers and brokers, prices of electric furnace grades are up $2.50 this week. The strength of the local market is reflected further in advances in blast furnace grades and cast iron scrap.

CLEVELAND—Purchase of a representative tonnage of No. 1 heavy melting steel at $34 by at least one major consumer in the valley clarified temporarily a torrid market here and in the valley. All grades, with the possible exception of machine shop turnings, are stronger sympathetically. Mills are watching developments very carefully, which should preclude a runaway market, but rumors that the next sale of No. 1 heavy melting will be in the $35 to $36 range give rise to some doubt.

ST. LOUIS—An already strong dealers' market has been made even stronger through the activity of an outside firm which is endeavoring to cover on a short interest in a new contract with a district steel mill. The result is that prices on melting grades advanced again this week. Other mills are still out of the market. The movement has been light, adding strength to the market.

BOSTON—Cast prices turned a lot stronger, with No. 1 cast up $3.50 a ton and No. 2 up $4. The spurt surprised brokers who are happier about prospects than they've been since 1948. No. 1 steel was up 50¢ a ton on a slightly more active steelmaking market.

CINCINNATI—Prices of openhearth and some other grades advanced in a hot market here. No. 1 heavy melting steel and No. 1 bundles are quotable at $29.50 top following sales to major consumers in this district. This market is picking up sympathetic strength from developments in other districts. But there is some local activity by converters and some movement of local tonnage into other consuming points. Foundry grades are slow but steady and a more active market for No. 2 grades seems to be shaping up.

BIRMINGHAM—With brokers anticipating price advances, only limited tonnages of scrap are being sold in this immediate area. For the past 30 days, railroad steel ordinarily bought in the Birmingham market has been shipped to points paying a higher price and quotations at Birmingham for most railroad steel grades are nominal and on the basis of last purchases.

BUFFALO—New orders were placed in the cast scrap market at prices running 50¢ to $1 a ton higher. Cupola was changing hands at $33-34 while top quality machinery material was bringing $37.50-$38. While this mild flurry was taking place in cast, activity in steelmaking items was generally confined to dealers covering recent orders.

This fire-extinguishing system saved $800 a month

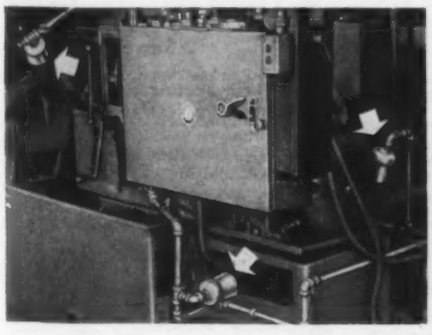
WE KNOW a big auto manufacturer who thinks of fire extinguishing systems as both protection and *production tools*.

In making valve stems they were using some automatic screw machines cooled by a light oil with a low flash point. Result—frequent fires! The company's chemical extinguishers put out the fires . . . but ruined the coolant and gummed up the machines. Result of this? There were from 16 hours to 3 days of lost time while the machines were cleaned and the oil replaced.

Finally *Kidde* extinguishing systems were installed. They detected and killed fires—automatically. Dry, clean, CO_2 smothered the flames quickly and effectively, then disappeared . . . leaving the oil unharmed and the machine clean as a whistle. *Downtime was cut to 1 hour!*

Company experts said that these *Kidde* systems, which cost $800 apiece, each paid for itself in the first month . . . *and kept right on saving $800 a month, every month.* They earned this money just as surely as if they were production tools.

If you'd like more information about these protection-giving production tools, write for complete information.



Arrows show location of Multijet Nozzles of Kidde Fire Extinguishing System attached to automatic screw machine. CO_2 pours from Multijet Nozzles—kills fires quickly, cleanly.

Walter Kidde & Company, Inc.
450 Main Street, Belleville 9, N. J.
In Canada:
Walter Kidde & Company of Canada, Ltd., Montreal, P. Q.

Kidde

Iron and Steel

SCRAP PRICES

Going prices as obtained in the trade by THE IRON AGE, based on representative tonnages. All prices are per gross ton delivered to consumer unless otherwise noted.

Pittsburgh

No. 1 hvy. melting	$32.50 to $33.00
No. 2 hvy. melting	28.50 to 29.00
No. 1 bundles	32.50 to 33.00
No. 2 bundles	26.50 to 27.00
Machine shop turn.	24.00 to 24.50
Mixed bor. and ms. turns.	24.00 to 24.50
Shoveling turnings	25.50 to 26.00
Cast iron borings	25.50 to 26.00
Low phos. plate	35.50 to 36.00
Heavy turnings	30.00 to 31.00
No. 1 RR. hvy. melting	34.50 to 35.00
Scrap rails, random lgth.	37.50 to 38.00
Rails 2 ft and under	39.00 to 40.00
RR. steel wheels	36.50 to 37.00
RR. spring steel	36.50 to 37.00
RR. couplers and knuckles	36.50 to 37.00
No. 1 machinery cast	39.00 to 40.00
Mixed yard cast.	35.50 to 36.00
Heavy breakable cast.	33.00 to 34.00
Malleable	35.00 to 36.00

Chicago

No. 1 hvy. melting	$28.00 to $29.00
No. 2 hvy. melting	26.00 to 27.00
No. 1 factory bundles	28.00 to 29.00
No. 1 dealers' bundles	27.00 to 28.00
No. 2 dealers' bundles	24.00 to 25.00
Machine shop turn.	18.50 to 19.00
Mixed bor. and turn.	19.00 to 20.00
Shoveling turnings	21.00 to 22.00
Cast iron borings	21.00 to 22.00
Low phos. forge crops	32.00 to 33.00
Low phos. plate	31.50 to 32.50
No. 1 RR. hvy. melting	30.00 to 31.00
Scrap rails, random lgth.	34.00 to 35.00
Rerolling rails	45.00 to 46.00
Rails 2 ft and under	41.00 to 42.00
Locomotive tires, cut	34.00 to 35.00
Cut bolsters & side frames	31.00 to 32.00
Angles and splice bars	37.00 to 38.00
RR. steel car axles	44.00 to 45.00
RR. couples and knuckles	32.00 to 33.00
No. 1 machinery cast.	41.00 to 42.00
No. 1 agricul cast.	38.00 to 39.00
Heavy breakable cast.	30.00 to 31.00
RR. grate bars	29.00 to 30.00
Cast iron brake shoes	30.00 to 31.00
Cast iron car wheels	36.00 to 37.00
Malleable	40.00 to 41.00

Philadelphia

No. 1 hvy. melting	$25.00 to $26.00
No. 2 hvy. melting	23.00 to 24.00
No. 1 bundles	25.00 to 26.00
No. 2 bundles	19.50 to 20.50
Machine shop turn.	17.50 to 18.00
Mixed bor. and turn.	16.50 to 17.00
Shoveling turnings	20.00 to 20.50
Low phos. punchings, plate	29.00 to 30.00
Low phos. 5 ft and under	28.00 to 29.00
Low phos. bundles	26.50 to 27.00
Hvy. axle forge turn.	25.00 to 26.00
Clean cast chem. borings	29.00 to 30.00
RR. steel wheels	31.00 to 32.00
RR. spring steel	31.00 to 32.00
Rails 18 in. and under	38.50 to 39.50
No. 1 machinery cast	37.00 to 38.00
Mixed yard cast	33.00 to 34.00
Heavy breakable cast	35.00 to 36.00
Cast iron carwheels	39.00 to 40.00
Malleable	39.00 to 40.00

Cleveland

No. 1 hvy. melting	$30.00 to $30.50
No. 2 hvy. melting	28.00 to 28.50
No. 1 busheling	30.00 to 30.50
No. 1 bundles	30.00 to 30.50
No. 2 bundles	24.50 to 25.00
Machine shop turn.	20.50 to 21.00
Mixed bor. and turn.	23.50 to 24.00
Shoveling turnings	23.50 to 24.00
Cast iron borings	23.50 to 24.00
Low phos. 2 ft and under	31.00 to 31.50
Steel axle turn.	29.00 to 29.50
Drop forge flashings	30.00 to 30.50
No. 1 RR. hvy. melting	34.00 to 34.50
Rails 3 ft and under	43.00 to 43.50
Rails 18 in. and under	44.00 to 45.00
No. 1 machinery cast.	44.00 to 44.50
RR. cast	44.00 to 44.50
RR. grate bars	32.00 to 33.00
Stove plate	36.00 to 37.00
Malleable	40.00 to 41.00

Youngstown

No. 1 hvy. melting	$33.50 to $34.00
No. 2 hvy. melting	31.50 to 32.00
No. 1 bundles	33.50 to 34.00
No. 2 bundles	$27.50 to $28.00
Machine shop turn.	23.00 to 23.50
Shoveling turnings	25.00 to 25.50
Cast iron borings	25.00 to 25.50
Low phos. plate	34.50 to 35.00

Buffalo

No. 1 hvy. melting	$29.50 to $30.00
No. 2 hvy. melting	27.50 to 28.00
No. 1 busheling	27.50 to 28.00
No. 1 bundles	28.50 to 29.00
No. 2 bundles	26.00 to 26.50
Machine shop turn.	18.00 to 18.50
Mixed bor. and turn.	19.00 to 19.50
Shoveling turnings	20.50 to 21.00
Cast iron borings	19.50 to 20.00
Low phos. plate	31.00 to 31.50
Scrap rails, random lgth.	33.50 to 34.00
Rails 2 ft and under	38.50 to 39.00
RR. steel wheels	33.00 to 33.50
RR. spring steel	33.00 to 33.50
RR. couplers and knuckles	33.00 to 33.50
No. 1 machinery cast.	37.50 to 38.00
No. 1 cupola cast.	33.00 to 34.00
Stove plate	32.00 to 32.50
Small indus. malleable	30.00 to 30.50

Birmingham

No. 1 hvy. melting	$24.00
No. 2 hvy. melting	22.00
No. 2 bundles	20.00
No. 1 busheling	23.00
Machine shop turn.	$18.00 to $18.50
Shoveling turnings	20.00 to 21.00
Cast iron borings	19.00
Bar crops and plate	28.00 to 29.00
Structural and plate	28.00 to 29.00
No. 1 RR. hvy. melt.	28.00 to 28.50
Scrap rails, random lgth.	29.00 to 30.00
Rerolling rails	36.00 to 37.00
Rails 2 ft and under	35.50 to 36.00
Angles & splice bars	33.50 to 34.50
Std. steel axles	28.00 to 29.00
No. 1 cupola cast.	35.00 to 36.00
Stove plate	30.50 to 31.50
Cast iron carwheels	30.00 to 31.00

St. Louis

No. 1 hvy. melting	$30.50 to $31.50
No. 2 hvy. melting	25.00 to 26.00
No. 2 bundled sheets	25.00 to 26.00
Machine shop turn.	16.00 to 17.00
Shoveling turnings	18.00 to 19.00
Rails, random lengths	33.00 to 34.00
Rails 3 ft and under	37.00 to 38.00
Locomotive tires, uncut	29.00 to 30.00
Angles and splice bars	35.00 to 36.00
Std. steel car axles	43.00 to 44.00
RR. spring steel	31.50 to 32.50
No. 1 machinery cast.	37.00 to 38.00
Hvy. breakable cast.	31.00 to 32.00
Cast iron brake shoes	30.00 to 31.00
Stove plate	29.00 to 30.00
Cast iron car wheels	35.00 to 36.00
Malleable	33.00 to 34.00

New York

Brokers' buying prices per gross ton, on cars:

No. 1 hvy. melting	$23.00 to $23.50
No. 2 hvy. melting	19.00 to 19.50
No. 2 bundles	17.00 to 17.50
Machine shop turn.	13.50 to 14.00
Mixed bor. and turn.	13.50 to 14.00
Shoveling turnings	15.00 to 15.50
Clean cast chem. bor.	23.00 to 24.00
No. 1 machinery cast.	29.50 to 30.00
Mixed yard cast.	27.00 to 27.50
Charging box cast.	28.00 to 28.50
Heavy breakable cast.	28.00 to 28.50
Unstrp. motor blocks	20.00 to 20.50

Boston

Brokers' buying prices per gross ton, on cars:

No. 1 hvy. melting	$21.00 to $22.00
No. 2 hvy. melting	17.50 to 18.50
No. 1 bundles	21.00 to 22.00
No. 2 bundles	$17.50 to $18.00
Machine shop turn.	13.00 to 13.50
Mixed bor. and turn.	13.00 to 13.50
Shoveling turnings	14.50 to 15.00
No. 1 busheling	21.00 to 21.50
Clean cast chem. borings	19.00 to 19.50
No. 1 machinery cast.	30.00 to 31.00
No. 2 machinery cast.	26.00 to 27.00
Heavy breakable cast.	27.00 to 28.00
Stove plate	25.00 to 26.00

Detroit

Brokers' buying prices per gross ton, on cars:

No. 1 hvy. melting	$24.50 to $25.00
No. 2 hvy. melting	22.00 to 22.50
No. 1 bundles	29.00 to 29.50
New busheling	28.00 to 28.50
Flashings	24.50 to 25.00
Machine shop turn.	17.50 to 18.00
Mixed bor. and turn.	17.50 to 18.00
Shoveling turnings	20.50 to 21.00
Cast iron borings	20.50 to 21.00
Low phos. plate	28.00 to 28.50
No. 1 cupola cast.	36.00 to 37.00
Heavy breakable cast.	28.00 to 30.00
Stove plate	32.00 to 33.00
Automotive cast.	40.00 to 41.00

Cincinnati

Per gross ton, f.o.b. cars:

No. 1 hvy. melting	$29.00 to $29.50
No. 2 hvy. melting	29.00 to 29.50
No. 1 bundles	28.00 to 28.50
No. 2 bundles	18.50 to 19.00
Machine shop turn.	16.50 to 17.00
Mixed bor. and turn.	16.50 to 17.00
Shoveling turnings	18.50 to 19.00
Cast iron borings	18.50 to 19.00
Low phos. 18 in. under	35.00 to 35.50
Rails, random lengths	36.50 to 37.50
Rails, 18 in. and under	44.00 to 45.00
No. 1 cupola cast	41.00 to 42.00
Hvy. breakable cast.	34.00 to 35.00
Drop broken cast	43.00 to 44.00

San Francisco

No. 1 hvy. melting	$20.00
No. 2 hvy. melting	18.00
No. 1 bundles	16.00
No. 2 bundles	16.00
No. 3 bundles	13.00
Machine shop turn.	9.00
Elec. fur. 1 ft and under	28.00
No. 1 RR. hvy. melting	20.00
Scrap rails, random lgth.	20.00
No. 1 cupola cast.	$30.00 to 33.50

Los Angeles

No. 1 hvy. melting	$20.00
No. 2 hvy. melting	18.00
No. 1 bundles	16.00
No. 2 bundles	16.00
No. 3 bundles	13.00
Mach. shop turn.	5.00
Elec. fur. 1 ft and under	30.00
No. 1 RR. hvy. melting	20.00
No. 1 cupola cast.	$32.50 to 35.00

Seattle

No. 1 hvy. melting	$18.00
No. 2 hvy. melting	18.00
No. 1 bundles	16.00
No. 2 bundles	16.00
No. 3 bundles	12.00
Elec. fur. 1 ft and under	$29.00 to 30.00
RR. hvy. melting	19.00
No. 1 cupola cast.	30.00 to 35.00
Heavy breakable cast.	20.00

Hamilton, Ont.

No. 1 hvy. melting	$24.00
No. 1 bundles	16.00
No. 2 bundles	16.00
Mechanical bundles	22.00
Mixed steel scrap	20.00
Mixed bor. and turn.	18.00
Rails, remelting	24.00
Rails, rerolling	27.00
Bushelings	18.50
Bush., new fact, prep'd.	22.00
Bush., new fact, unprep'd.	17.00
Short steel turnings	18.00
Cast scrap	$40.00 to 43.00

FIRST COUSINS

Offhand, there seems to be little connection between reinforcing bars and rails. Yet, from discarded rails, Rerolling Mills produce reinforcing bars and more than 500 sections and sizes of merchant bars for use in the manufacture of a myriad of fabricated steel articles.

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LEADERS IN IRON AND STEEL SCRAP SINCE 1889

Comparison of Prices

Steel prices on this page are the average of various f.o.b. quotations of major producing areas: Pittsburgh, Chicago, Gary, Cleveland, Youngstown.

Flat-Rolled Steel: (cents per pound)	Apr. 18, 1950	Apr. 11, 1950	Mar. 21, 1950	Apr. 19, 1949
Hot-rolled sheets	3.35	3.35	3.35	3.25
Cold-rolled sheets	4.10	4.10	4.10	4.00
Galvanized sheets (10 ga)	4.40	4.40	4.40	4.40
Hot-rolled strip	3.25	3.25	3.25	3.25
Cold-rolled strip	4.21	4.21	4.21	4.038
Plates	3.50	3.50	3.50	3.42
Plates wrought iron	7.85	7.85	7.85	7.85
Stains C-R strip (No. 302)	33.00	33.00	33.00	33.25
Tin and Terneplate: (dollars per base box)				
Tinplate (1.50 lb) cokes	$7.50	$7.50	$7.50	$7.75
Tinplate, electro (0.50 lb)	6.60	6.60	6.60	6.70
Special coated mfg. ternes	6.50	6.50	6.50	6.65
Bars and Shapes: (cents per pound)				
Merchant bars	3.45	3.45	3.45	3.35
Cold-finished bars	4.145	4.145	4.145	3.995
Alloy bars	3.95	3.95	3.95	3.75
Structural shapes	3.40	3.40	3.40	3.25
Stainless bars (No. 302)	28.50	28.50	28.50	28.50
Wrought iron bars	9.50	9.50	9.50	9.50
Wire: (cents per pound)				
Bright wire	4.50	4.50	4.50	4.15
Rails: dollars per 100 lb)				
Heavy rails	$3.40	$3.40	$3.40	$3.20
Light rails	3.75	3.75	3.75	3.55
Semifinished Steel: (dollars per net ton)				
Rerolling billets	$54.00	$54.00	$54.00	$52.00
Slabs, rerolling	54.00	54.00	54.00	52.00
Forging billets	63.00	63.00	63.00	61.00
Alloy blooms, billets, slabs	66.00	66.00	66.00	63.00
Wire Rod and Skelp: (cents per pound)				
Wire rods	3.85	3.85	3.85	3.40
Skelp	3.15	3.15	3.15	3.25

Price advances over previous week are printed in Heavy Type; declines appear in *Italics*.

Pig Iron: (per gross ton)	Apr. 18, 1950	Apr. 11, 1950	Mar. 21, 1950	Apr. 19, 1949
No. 2, foundry, Phila.	$50.42	$50.42	$50.42	$50.65
No. 2, Valley furnace	46.50	46.50	46.50	46.50
No. 2, Southern Cin'ti	49.08	49.08	49.08	49.47
No. 2, Birmingham	42.38	42.38	42.38	43.38
No. 2, foundry, Chicago†	46.50	46.50	46.50	46.50
Basic del'd Philadelphia	49.92	49.92	49.92	49.81
Basic, Valley furnace	46.00	46.00	46.00	46.50
Malleable, Chicago†	46.50	46.50	46.50	46.50
Malleable, Valley	46.50	46.50	46.50	46.50
Charcoal, Chicago	68.56	68.56	68.56	73.78
Ferromanganese‡	173.40	173.40	173.40	173.40

†The switching charge for delivery to foundries in the Chicago district is $1 per ton.
‡Average of U. S. prices quoted on Ferroalloy page.

Scrap: (per gross ton)				
Heavy melt'g steel, P'gh.	$32.75	$32.75	$32.25	$24.75
Heavy melt'g steel, Phila.	25.50	25.25	24.50	22.00
Heavy melt'g steel, Ch'go	28.50	28.50	28.50	21.50
No. 1 hy. com. sh't, Det.	29.25	26.75	25.50	16.75
Low phos. Young'n	34.75	33.75	32.75	24.75
No. 1, cast, Pittsburgh	39.50	39.50	39.50	33.50
No. 1, cast, Philadelphia	37.50	37.50	36.50	28.00
No. 1, cast, Chicago	41.50	41.50	39.50	29.50
Coke: Connellsville: (per net ton at oven)				
Furnace coke, prompt	$14.25	$14.25	$14.25	$14.50
Foundry coke, prompt	16.25	16.25	16.25	16.50
Nonferrous Metals: (cents per pound to large buyers)				
Copper, electro, Conn.	18.50	18.50	18.50	21.50
Copper, Lake Conn.	18.625	18.625	18.625	23.625
Tin Straits, New York	77.00†	76.25*	77.25	$1.03
Zinc, East St. Louis	10.50	10 50	10.00	13.00
Lead, St. Louis	10.30	10.30	10.30	14.80
Aluminum, virgin	17.00	17.00	17.00	17.00
Nickel electrolytic	42.97	42.97	42.97	42.93
Magnesium, ingot	20.50	20.50	20.50	20.50
Antimony, Laredo, Tex.	24.50	24.50	24.50	38.50

* Revised. † Tentative.

Composite Prices

Starting with the issue of May 12, 1949, the weighted finished steel composite was revised for the years 1941 to date. The weights used are based on the average product shipments for the 7 years 1937 to 1940 inclusive and 1946 to 1948 inclusive. The use of quarterly figures has been eliminated because it was too sensitive. (See p. 130 of May 12, 1949, issue.)

	Finished Steel Base Price	Pig Iron	Scrap Steel
Apr. 18, 1950	3.837¢ per lb.	$46.38 per gross ton	$28.92 per gross ton
One week ago	3.837¢ per lb.	46.38 per gross ton	28.83 per gross ton
One month ago	3.837¢ per lb.	46.38 per gross ton	28.42 per gross ton
One year ago	3.749¢ per lb.	46.59 per gross ton	22.75 per gross ton

	High	Low
1950	3.837¢ Jan. 3	3.837¢ Jan. 3
1949	3.837¢ Dec. 27	3.3705¢ May 3
1948	3.721¢ July 27	3.193¢ Jan. 1
1947	3.193¢ July 29	2.848¢ Jan. 1
1946	2.848¢ Dec. 31	2.464¢ Jan. 1
1945	2.464¢ May 29	2.396c Jan. 1
1944	2.396¢	2.396¢
1943	2.396¢	2.396¢
1942	2.396¢	2.396¢
1941	2.396¢	2.396¢
1940	2.30467¢ Jan. 2	2.24107¢ Apr. 16
1939	2.35367¢ Jan. 3	2.26689¢ May 16
1938	2.58414¢ Jan. 4	2.27207¢ Oct. 18
1937	2.58414¢ Mar. 9	2.32263¢ Jan. 4
1936	2.32263¢ Dec. 28	2.05200¢ Mar. 10
1935	2.07642¢ Oct. 1	2.06492¢ Jan. 8
1932	1.89196¢ July 5	1.83910¢ Mar. 1
1929	2.31773¢ May 28	2.26498¢ Oct. 29

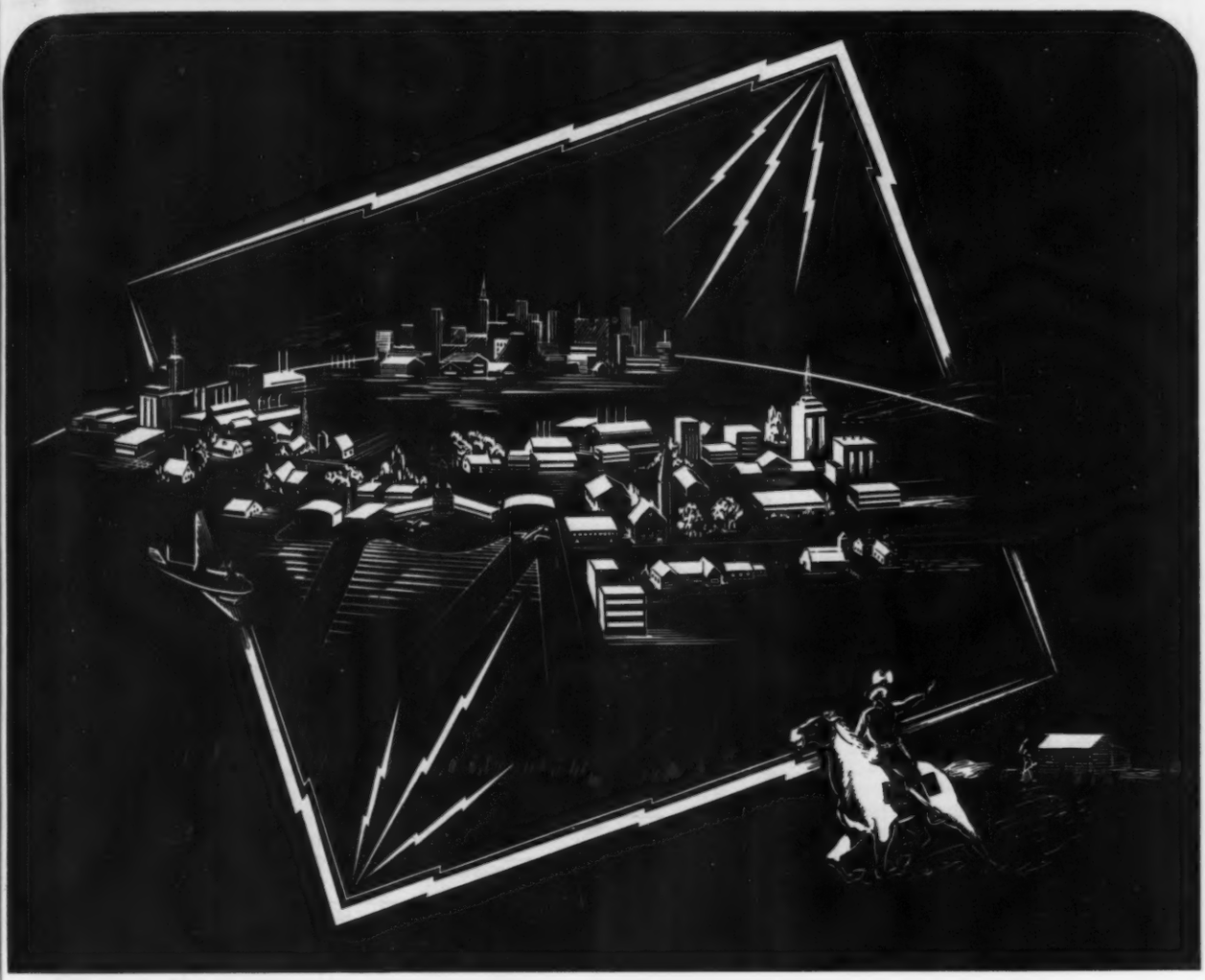
Weighted index based on steel bars, shapes, plates, wire, rails, black pipe, hot and cold-rolled sheets and strip, representing major portion of finished steel shipment. Index recapitulated in Aug. 28, 1941, issue and in May 12, 1949.

	High	Low
1950	$46.38 Feb. 7	$45.88 Jan. 3
1949	46.87 Jan. 18	45.88 Sept. 6
1948	46.91 Oct. 12	39.58 Jan. 6
1947	37.98 Dec. 30	30.14 Jan. 7
1946	30.14 Dec. 10	25.37 Jan. 1
1945	25.37 Oct. 23	23.61 Jan. 2
1944	$23.61	$23.61
1943	23.61	23.61
1942	23.61	23.61
1941	$23.61 Mar. 20	$23.45 Jan. 2
1940	23.45 Dec. 23	22.61 Jan. 2
1939	22.61 Sept. 19	20.61 Sept. 12
1938	23.25 June 21	19.61 July 6
1937	23.25 Mar. 9	20.25 Feb. 16
1936	19.74 Nov. 24	18.73 Aug. 11
1935	18.84 Nov. 5	17.83 May 14
1932	14.81 Jan. 5	13.56 Dec. 6
1929	18.71 May 14	18.21 Dec. 17

Based on averages for basic iron at Valley furnaces and foundry iron at Chicago, Philadelphia, Buffalo, Valley and Birmingham.

	High	Low
1950	$28.92 Apr. 18	$26.25 Jan. 3
1949	43.00 Jan. 4	19.33 June 28
1948	43.16 July 27	39.75 Mar. 9
1947	42.58 Oct. 28	29.50 May 20
1946	31.17 Dec. 24	19.17 Jan. 1
1945	19.17 Jan. 2	18.92 May 22
1944	19.17 Jan. 11	15.76 Oct. 24
1943	$19.17	$19.17
1942	19.17	19.17
1941	$22.00 Jan. 7	$19.17 Apr. 10
1940	21.83 Dec. 30	16.04 Apr. 9
1939	22.50 Oct. 3	14.08 May 16
1938	15.00 Nov. 22	11.00 June 7
1937	21.92 Mar. 30	12.67 June 9
1936	17.75 Dec. 21	12.67 June 8
1935	13.42 Dec. 10	10.33 Apr. 29
1932	8.50 Jan. 12	6.43 July 5
1929	17.58 Jan. 29	14.08 Dec. 8

Average of No. 1 heavy melting steel scrap delivered to consumers at Pittsburgh, Philadelphia and Chicago.



SINCE 1850

THE COMMUNICATIONS INDUSTRY

in its advance from the hard riding pony express to instantaneous communication throughout the world, has been paced by the production and transportation of the necessary ores from which have been made the metals that have made its developments possible.

LAKE SUPERIOR IRON ORE • FERRO ALLOYS
VESSEL TRANSPORTATION • COAL

THE Cleveland-Cliffs IRON COMPANY

UNION COMMERCE BUILDING • CLEVELAND 14, OHIO

STEEL PRICES

Smaller numbers in price boxes indicate producing companies. For main office locations, see key on facing page.
Base prices at producing points apply only to sizes and grades produced in these areas. Prices are in cents per lb unless otherwise noted. Extras apply.

	Pittsburgh	Chicago	Gary	Cleveland	Canton-Massillon	Middletown	Youngstown	Bethlehem	Buffalo	Conshohocken	Johnstown	Sparrows Point	Granite City	Detroit
INGOTS Carbon forging, net ton	$50.00 1													$50.00 31
Alloy, net ton	$51.00 1.17													$51.00 31
BILLETS, BLOOMS, SLABS Carbon, rerolling, net ton	$53.00 1	$53.00 1	$53.00 1				$57.00 13		$53.00 3	$58.00 26	$53.00 3			
Carbon forging billets, net ton	$63.00 1	$63.00 1.4	$63.00 1.8	$63.00 4			$63.00 25		$63.00 3.4	$65.00 26	$63.00 3			$63.00 31
Alloy, net ton	$66.00 1.17	$66.00 1.4	$66.00 1		$66.00 4.42		$66.00 13	$66.00 3	$66.00 3.4	$68.00 26	$66.00 3			$66.00 31
SHEET BARS							$57.00 13							
PIPE SKELP	3.15 1						3.15 1.4							
WIRE RODS	3.85 2.18	3.85 2.4.33	3.85 6	3.85 2			3.85 6				3.85 3	3.95 3		
SHEETS Hot-rolled (18 ga. & hvr.)	3.35 1.5.9.15	3.35 23	3.35 1.6.8	3.35 4.5			3.35 1.4.6.13		3.35 3	3.45 26		3.35 3		3.55 12
Cold-rolled	4.10[1-5] 7.9.15.63		4.10 1.6.8	4.10 4.15		4.10 7	4.10 4.6		4.10 3			4.10 3	4.30 22	4.30 12
Galvanized (10 gage)	4.40 1.9.15		4.40 1.8		4.40 4		4.65[24] 4.75[44]					4.40 3		
Enameling (12 gage)	4.40 1		4.40 1.8	4.40 4		4.40 7	4.40[6] 4.90[76]						4.60 22	4.70 12
Long ternes (10 gage)	4.80 9.15		4.80 1			4.80 7	4.80 64							
Hi Str. low alloy, h.r.	5.05 1.5.9	5.05 1	5.05 1.6.8	5.05 4.5			5.05 1.4.6.13		5.05 3	5.05 26		5.05 3		5.25 12
Hi str. low alloy, c.r.	6.20 1.5.9		6.20 1.6.8	6.20 4.5			6.20 4.6.13		6.20 3			6.20 3		6.40 12
Hi str. low alloy, galv.	6.75 1											6.75 3		
STRIP Hot-rolled	3.25 5.7.9.23	3.25 3.66	3.25 1.6.8	3.25 5			3.25 1.4.6.13		3.25 3	3.35 26		3.25 3		3.45 12.47
Cold-rolled	4.15 5.7.9.63	4.30 8.66	4.30 8	4.15 2.5		4.15 7	4.15 4.6.13.40.48.49		4.15 3			4.15 3		4.40[8.81] 4.35[12.47]
Hi str. low alloy, h.r.	4.95 9		4.95 1.6.8	4.95 5			4.95 1.4.6.13		4.95 3	4.95 26		4.95 3		5.15 12
Hi Str. low alloy, c.r.	6.20 9			6.20 2.5			6.20 4.6.13		6.20 3			6.20 3		6.40 12
TINPLATE† Cokes, 1.50-lb base box 1.25 lb, deduct 20¢	$7.50 1.5.9.15		$7.50 1.6.8				$7.50 4					$7.60 3	$7.70 22	
Electrolytic 0.25, 0.50, 0.75 lb box	Deduct $1.15, 90¢ and 65¢ respectively from 1.50-lb coke base box price													
BLACKPLATE, 29 gage Hollowware enameling	5.30 1.5.15		5.30 1.6				5.30 4					5.40 3	5.50 22	
BARS Carbon steel	3.45 1.5.9.17	3.45 1.4.23	3.45 1.6.8	3.45 4	3.45 4		3.45 1.4.6		3.45 3.4		3.45 3			3.65 12
Reinforcing‡	3.45 1.5	3.45 4	3.45 1.6.8	3.45 4			3.45 1.4.6		3.45 3.4		3.45 3	3.45 3		
Cold-finished	4.10[5] 4.15[2-4] 17.62.69.71	4.15[2] 23.69.70	4.15 4.73.74	4.15 2.61	4.15 4.32.62		4.15 6.40.57		4.15 70					4.35[12] 4.30[64]
Alloy, hot-rolled	3.95 1.17	3.95 1.4.23	3.95 1.6.8		3.95 4		3.95 1.6.25	3.95 3	3.95 3.4		3.95 3			4.25 12
Alloy, cold-drawn	4.90 2.17.62.69.71	4.90 2.23.69.70	4.90 4.73.74	4.90 2.61	4.90 4.42.62		4.90 5.25.57	4.90 3	4.90 3.70					5.05[64]
Hi str. low alloy, h.r.	5.20 1.5		5.20 1.6.8	5.20 4			5.20 1.6	5.20 3	5.20 3		5.20 3			5.40 12
PLATE Carbon steel	3.50 1.5	3.50 1	3.50 1.6.8	3.50 4			3.50 1.13		3.50 3	3.60 26	3.50 3	3.50 3		3.75 12
Floor Plates	4.55 1	4.55 1	4.55 3	4.55 5						4.55 26				
Alloy	4.40 1	4.40 1	4.40 1				4.40 13			4.40 26	4.40 3	4.40 3		
Hi Str. low alloy	5.35 1.5	5.35 1	5.35 1.8	5.35 4.5			5.35 6			5.35 26	5.35 3	5.35 3		5.60 12
SHAPES, Structural	3.40 1.5.9	3.40 1.23	3.40 1.6.8					3.45 3	3.45 3		3.45 3			
Hi Str. low alloy	5.15 1.5	5.15 1	5.15 1.6.8				5.15 6	5.15 3	5.15 3		5.15 3			
MANUFACTURER'S WIRE Bright	4.50 2.5.18	4.50[2] 4.13.33.34		4.50 2.77			4.50 6	Kokomo=4.60[30]			4.50 3	4.60 3	Duluth=4.50[2] Pueblo=4.75[14]	
PILING, Steel Sheet	4.20[1-9]	4.20 1							4.20 3					

Smaller numbers indicate producing companies. See key at right. Prices are in cents per lb unless otherwise noted. Extras apply.

STEEL PRICES

Kansas City	Houston	Birmingham	WEST COAST Seattle, San Francisco, Los Angeles, Fontana		
					INGOTS Carbon forging net ton
	$59.00 53				Alloy, net ton
		$53.00 11	F=$72.00[19]		BILLETS, BLOOMS, SLABS Carbon, rerolling, net ton
	$71.00 53	$63.00 11	F=$82.00[19]	Geneva=$61.00[16]	Carbon forging billets, net ton
	$74.00 53		F=$85.00[19]		Alloy net ton
				Portsmouth=$55.00[20]	SHEET BARS
					PIPE SKELP
	4.25 53	3.85 11	SF=4.50[24] LA=4.65[24,63]	Portsmouth=3.85[20] Worcester=4.15[2]	WIRE RODS
		3.35 4.11	SF, LA=4.05[24] F=4.25[19]	Ashland[7]=3.35 Niles=3.50[64]	SHEETS Hot-rolled (18 ga. & hvr.)
		4.10 11	SF=5.05[24] F=5.00[19]		Cold-rolled
		4.40 4.11	SF, LA=5.15[24]	Ashland=4.40[7] Kokomo=4.50[30]	Galvanized (10 gage)
					Enameling (12 gage)
					Long ternes (10 gage)
		5.05 11	F=6.74[19]		Hi Str. low alloy, h.r.
			F=7.05[19]		Hi Str. low alloy, c.r.
					Hi Str. low alloy, galv.
3.85 53	3.65 53	3.25 11	SF, LA=4.00[24,63] F=4.40[19], S=4.25[62]	Ashland=3.25[7] Atlanta=3.40[65]	STRIP Hot-rolled
			F=5.40[19] LA=5.50[27]	New Haven=4.65[3,68]	Cold-rolled
		4.95 11	F=6.64[19]		Hi Str. low alloy, h.r.
			F=6.95[19]		Hi Str. low alloy, c.r.
		7.60 11	SF=8.25[24]		TINPLATE Cokes, 1.50-lb base box 1.25 lb, deduct 20¢
Deduct $1.15, 90¢ and 65¢ respectively from 1.50-lb coke base box price					Electrolytic 0.25, 0.50, 0.75 lb box
					BLACKPLATE, 29 gage Hollowware enameling
4.05 53	3.85 53	3.45 4.11	SF, LA=4.15[24] LA=4.15[62]	Atlanta=3.60[65]	BARS Carbon steel
4.05 53	3.85 53	3.45 4.11	SF, S=4.20[62] F=4.10[19]	Atlanta=3.60[65]	Reinforcing‡
				Putnam, Newark=4.55[69]	Cold-finished
4.55 53	4.35 53		LA=5.00[63] F=4.95[19]		Alloy, hot-rolled
				Newark,[69] Worcester[2]=5.20 Hartford=5.20[4]	Alloy, cold-drawn
		5.20	F=6.25[19]		Hi Str. low alloy, h.r.
	3.90 53	3.50 4.11	F=4.10[19] S=4.40[62] Geneva=3.50[16]	Claymont=3.60[29] Coatesville=3.60[21] Harrisburg=3.50[35]	PLATE Carbon steel
				Harrisburg=4.55[35]	Floor plates,
			F=5.40[19]	Coatesville=4.50[21]	Alloy
		5.35 11	F=5.95[19]	Geneva=5.35[16]	Hi Str. low alloy
4.00 53	3.80 53	3.40 11	SF=3.95[62] LA=4.00[24,63]	Phoenixville=3.30[56] Geneva=3.40[16]	SHAPES, Structural
		5.15 11	F=4.00[19] S=4.05[62]	Fontana=5.75[19] Geneva=5.15[16]	Hi Str. low alloy
5.10 53	4.90 53	4.50 4.11	SF, LA=5.45[24,63]	Portsmouth=4.50[20] Worcester=4.80[2]	MANUFACTURER'S WIRE Bright

Notes: †Special coated mfg ternes deduct $1.00 from 1.50-lb coke base box price. Can-making quality blackplate, 55 to 128-lb, deduct $1.90 from 1.50-lb coke base box. ‡Straight lengths only from producer to fabricator.

KEY TO STEEL PRODUCERS

With Principal Offices

1 Carnegie-Illinois Steel Corp., Pittsburgh
2 American Steel & Wire Co., Cleveland
3 Bethlehem Steel Co., Bethlehem
4 Republic Steel Corp., Cleveland
5 Jones & Laughlin Steel Corp., Pittsburgh
6 Youngstown Sheet & Tube Co., Youngstown
7 Armco Steel Corp., Middletown, Ohio
8 Inland Steel Co., Chicago
9 Weirton Steel Co., Weirton, W. Va.
10 National Tube Co., Pittsburgh
11 Tennessee Coal, Iron & R. R. Co., Birmingham
12 Great Lakes Steel Corp., Detroit
13 Sharon Steel Corp., Sharon, Pa.
14 Colorado Fuel & Iron Corp., Denver
15 Wheeling Steel Corp., Wheeling, W. Va.
16 Geneva Steel Co., Salt Lake City
17 Crucible Steel Co. of America, New York
18 Pittsburgh Steel Co., Pittsburgh
19 Kaiser Co., Inc., Oakland, Calif.
20 Portsmouth Steel Corp., Portsmouth, Ohio
21 Lukens Steel Co., Coatesville, Pa.
22 Granite City Steel Co., Granite City, Ill.
23 Wisconsin Steel Co., South Chicago, Ill.
24 Columbia Steel Co., San Francisco
25 Copperweld Steel Co., Glassport, Pa.
26 Alan Wood Steel Co., Conshohocken, Pa.
27 Calif. Cold Rolled Steel Corp., Los Angeles
28 Allegheny Ludlum Steel Corp., Pittsburgh
29 Worth Steel Co., Claymont, Del.
30 Continental Steel Corp., Kokomo, Ind.
31 Rotary Electric Steel Co., Detroit
32 Laclede Steel Co., St. Louis
33 Northwestern Steel & Wire Co., Sterling, Ill.
34 Keystone Steel & Wire Co., Peoria, Ill.
35 Central Iron & Steel Co., Harrisburg, Pa.
36 Carpenter Steel Co., Reading, Pa.
37 Eastern Stainless Steel Corp., Baltimore
38 Washington Steel Corp., Washington, Pa.
39 Jessop Steel Co., Washington, Pa.
40 Blair Strip Steel Co., New Castle, Pa.
41 Superior Steel Corp., Carnegie, Pa.
42 Timken Steel & Tube Div., Canton, Ohio
43 Babcock & Wilcox Tube Co., Beaver Falls, Pa.
44 Reeves Steel & Mfg. Co., Dover, Ohio
45 John A. Roebling's Sons Co., Trenton, N. J.
46 Simonds Saw & Steel Co., Fitchburg, Mass.
47 McLouth Steel Corp., Detroit
48 Cold Metal Products Co., Youngstown
49 Thomas Steel Co., Warren, Ohio
50 Wilson Steel & Wire Co., Chicago
51 Sweet's Steel Co., Williamsport, Pa.
52 Superior Drawn Steel Co., Monaca, Pa.
53 Tremont Nail Co., Wareham, Mass.
54 Firth Sterling Steel & Carbide Corp., McKeesport, Pa.
55 Ingersoll Steel Div., Chicago
56 Phoenix Iron & Steel Co., Phoenixville, Pa.
57 Fitzsimmons Steel Co., Youngstown
58 Stanley Works, New Britain, Conn.
59 Universal-Cyclops Steel Corp., Bridgeville, Pa.
60 American Cladmetals Co., Carnegie, Pa.
61 Cuyahoga Steel & Wire Co., Cleveland
62 Bethlehem Pacific Coast Steel Corp., San Francisco
63 Follansbee Steel Corp., Pittsburgh
64 Niles Rolling Mill Co., Niles, Ohio
65 Atlantic Steel Co., Atlanta
66 Acme Steel Co., Chicago
67 Joslyn Mfg. & Supply Co., Chicago
68 Detroit Steel Corp., Detroit
69 Wyckoff Steel Co., Pittsburgh
70 Bliss & Laughlin, Inc., Harvey, Ill.
71 Columbia Steel & Shafting Co., Pittsburgh
72 Cumberland Steel Co., Cumberland, Md.
73 La Salle Steel Co., Chicago
74 Monarch Steel Co., Inc., Hammond, Ind.
75 Empire Steel Co., Mansfield, Ohio
76 Mahoning Valley Steel Co., Niles, Ohio
77 Oliver Iron & Steel Co., Pittsburgh
78 Pittsburgh Screw & Bolt Co., Pittsburgh
79 Standard Forging Corp., Chicago
80 Driver Harris Co., Harrison, N. J.
81 Detroit Tube & Steel Div., Detroit
82 Reliance Div., Eaton Mfg. Co., Massillon, Ohio
83 Sheffield Steel Corp., Kansas City
84 Plymouth Steel Co., Detroit

MERCHANT WIRE PRODUCTS

To the dealer, f.o.b. mill

	Base Column	Pittsburg, Calif.
Standard & coated nails*	106	125§
Woven wire fence†	116	139
Fence posts, carloads††	116	...
Single loop bale ties	113	137
Galvanized barbed wire**	126	146
Twisted barbless wire	126	146

* Pgh., Chi., Duluth; Worcester, 6 columns higher; Houston, 8 columns higher; Kansas City, 12 columns higher. † 15½ gage and heavier. ** On 80 rod spools, in carloads. †† Duluth, Joliet; Johnstown, 112.

	Base per 100 lb	Pittsburg, Calif.
Merch. wire, annealed‡	$5.35	$6.30
Merch. wire, galv.‡	5.60	6.55
Cut nails, carloads‡‡	6.75	...

‡ Add 30¢ at Worcester; 20¢ at Chicago; 10¢ at Sparrows Pt.
‡‡ Less 20¢ to jobbers.
§ Torrance, 126.

PRODUCING POINTS — *Standard, Coated or galvanized nails, woven wire fence, bale ties, and barbed wire:* Alabama City, Ala., 4; Atlanta, 65; Aliquippa, Pa. (except bale ties), 5; Bartonville, Ill. (except bale ties), 34; Chicago, 4; Donora, Pa., 2; Duluth, 2; Fairfield, Ala., 11; Johnstown, Pa. (except bale ties), 3; Joliet, Ill., 2; Kokomo, Ind., 30; Minnequa, Colo., 14; Monessen, Pa. (except bale ties), 18; Pittsburg, Calif., 24; Portsmouth, Ohio, 20; Rankin, Pa. (except bale ties), 2; Sparrows Point (except woven fence), 3; Sterling, Ill., 33; San Francisco (except nails and woven fence), 14; Torrance, Calif. (nails only), 24; Worcester (nails only), 2; Houston (except bale ties), 83; Kansas City, 83.
Fence posts: Duluth, 2; Johnstown, Pa., 3; Joliet, Ill., 2; Minnequa, Colo., 14; Moline, Ill., 4; Williamsport, Pa., 51.
Cut nails: Wheeling, W. Va., 15; Conshohocken, Pa., 26; Warehame, Mass., 53.

CLAD STEEL

Base prices, cents per pound, f.o.b. mill

Stainless-carbon	Plate	Sheet
No. 304, 20 pct,		
Coatesville, Pa. (21)	*26.50	
Washgtn, Pa. (39)	*26.50	
Claymont, Del. (29)	*26.50	
Conshohocken, Pa. (26)		*22.50
New Castle, Ind. (55)	*26.50	*24.00
Nickel-carbon		
10 pct, Coatesville (26)	37.50	
Inconel-carbon		
10 pct, Coatesville (21)	36.00	
Monel-carbon		
10 pct, Coatesville (21)	29.00	
No. 302 Stainless-copper-stainless, Carnegie, Pa. (60)		75.00
Aluminized steel sheets, hot dip, Butler, Pa. (7)		7.75

* Includes annealing and pickling, or sandblasting.

ELECTRICAL SHEETS

22 gage, HR cut lengths, f.o.b. mill

	Cents per lb
Armature	6.20
Electrical	6.70
Motor	*7.95
Dynamo	8.75
Transformer 72	9.30
Transformer 65	9.85
Transformer 58	10.55
Transformer 52	11.35

PRODUCING POINTS—Beech Bottom, W. Va., 18; Brackenridge, Pa., 28; Follansbee, W. Va., 63; Granite City, Ill., 22*, add 0.20¢; Indiana Harbor, Ind., 8; Mansfield, Ohio, 75; Niles, Ohio, 64, 76; Vandergrift, Pa., 1; Warren, Ohio, 4; Zanesville, Ohio, 7.

Numbers after producing points correspond to steel producers. See key on Steel Price page.

BOLTS, NUTS, RIVETS, SET SCREWS

Consumer Prices

(Bolts and nuts, f.o.b. mill Pittsburgh, Cleveland, Birmingham or Chicago)
Base discount

Machine and Carriage Bolts

	Pct Off List Less Case	C.
½ in. & smaller x 6 in. & shorter	27	33
9/16 & ⅝ in. x 6 in. & shorter	29	40
¾ in. & larger x 6 in. shorter	26	37
All diam., longer than 6 in.	22	34
Lag, all diam over 6 in. & longer	28	39
Lag, all diam x 6 in. & shorter	30	41
Plow bolts	40	—

Nuts, Cold Punched or Hot Pressed

(Hexagon or Square)

	Pct Off List Reg	Hvy	Lt
½ in. and smaller	41	35	41
9/16 to ⅝ in.	36	30	36
¾ to 1½ in. inclusive	31	27	33
1⅝ in. and larger	21	17	...

In full case lots, 15 pct additional discount.

Stove Bolts

	Pct Off List
Packaged, steel, plain finish	63
Packaged, plated finish	50
Bulk, plain finish**	69*

*Discounts apply to bulk shipments in not less than 15,000 pieces of a size and kind where length is 3-in. and shorter; 5000 pieces for lengths longer than 3-in. For lesser quantities, packaged price applies.
**Zinc, Parkerized, cadmium or nickel plated finishes add 6¢ per lb net. For black oil finish, add 2¢ per lb net.

Large Rivets

(½ in. and larger)

	Base per 100 lb
F.o.b. Pittsburgh, Cleveland, Chicago, Birmingham, Lebanon, Pa.	$7.25

Small Rivets

(7/16 in. and smaller)

	Pct Off List
F.o.b. Pittsburgh, Cleveland, Chicago, Birmingham	43

Cap and Set Screws

(In bulk)	Pct Off List
Hexagon head cap screws, coarse or fine thread, ¼ in. thru ⅝ in. x 6 in., SAE 1020, bright	60
¼ in. through ⅝ in. x 6 in. and shorter high C heat treated	54
Milled studs	33
Flat head cap screws, listed sizes	34
Fillister head cap, listed sizes	42
Set screws, sq head, cup point, 1 in., diam and smaller x 6 in. and shorter	59

C-R SPRING STEEL

Base per pound f.o.b. mill

0.26 to 0.40 carbon	4.15¢
0.41 to 0.60 carbon	5.95¢
0.61 to 0.80 carbon	6.55¢
0.81 to 1.05 carbon	8.50¢
1.06 to 1.35 carbon	10.80¢

Worcester, add 0.30¢.

LAKE SUPERIOR ORES

(51.50% Fe; natural content, delivered lower lake ports)

	Per gross ton
Old range, bessemer	$8.10
Old range, nonbessemer	7.95
Mesabi, bessemer	7.85
Mesabi, nonbessemer	7.70
High phosphorus	7.70

After Jan. 25, 1950, increases or decreases in Upper Lake rail freight, dock handling charges and taxes are for buyers' account.

RAILS, TRACK SUPPLIES

F.o.b. mill

Standard rails, 100 lb and heavier, No. 1 quality, per 100 lb	$3.40
Joint bars, per 100 lb	4.40
Light rails, per 100 lb	3.75

	Base Price cents per lb
Track spikes†	5.60
Axles	5.25
Screw spikes	8.60
Tie plates	4.20
Pittsburg, Torr., Calif.; Seattle	4.35
Track bolts, untreated**	8.85
Track bolts, heat treated, to railroads**	9.10

** Minnequa, deduct 25¢
† Kansas City, 5.85¢.

PRODUCING POINTS—*Standard rails:* Bessemer, Pa., 1; Ensley, Ala., 11; Gary, 1; Indiana Harbor, Ind., 8; Lackawanna, N. Y., 3; Minnequa, Colo., 14; Steelton, Pa., 3.
Light rails: All the above except Indiana Harbor and Steelton, plus Fairfield, Ala., 11; Johnstown, Pa., 3; Minnequa, Colo., 14.
Joint bars: Bessemer, Pa., 1; Fairfield, Ala., 11; Indiana Harbor, Ind., 8; Joliet, Ill., 1; Lackawanna, N. Y., 3; Steelton, Pa., 3; Minnequa, Colo., 14.
Track spikes: Fairfield, Ala., 11; Indiana Harbor, Ind., 6, 8; Lebanon, Pa., 3; Minnequa, Colo., 14; Pittsburgh, 5; Chicago, 4; Struthers, Ohio, 6; Youngstown, 4.
Track bolts: Fairfield, Ala., 11; Lebanon, Pa., 3; Minnequa, Colo., 14; Pittsburgh, 77, 78.
Axles: Fairfield, Ala., 11; Gary, 1; Indiana Harbor, Ind., 79; Johnstown, Pa., 3; McKees Rocks, Pa., 1.
Tie plates: Fairfield, Ala., 11; Gary, 1; Indiana Harbor, Ind., 8; Lackawanna, N. Y., 3; Pittsburg, Calif., 24; Pittsburgh, 4; Seattle, 62; Steelton, Pa., 3; Torrance, Calif., 24; Minnequa, Colo., 14.

TOOL STEEL

F.o.b. mill

W	Cr	V	Mo	Co	Base per lb
18	4	1	—	—	$1.00
18	4	1	—	5	$1.565
18	4	2	—	—	$1.13
1.5	4	1.5	8	—	71.5¢
6	4	2	6	—	76.5¢

High-carbon-chromium	57.5¢
Oil hardened manganese	33¢
Special carbon	29.5¢
Extra carbon	24.5¢
Regular carbon	21¢

Warehouse prices on and east of Mississippi are 2½¢ per lb higher. West of Mississippi, 4½¢ higher.

COKE

	Net Ton
Furnace, beehive (f.o.b. oven) Connellsville, Pa.	$14.00 to $14.50
Foundry, beehive (f.o.b. oven) Connellsville, Pa.	$16.00 to $16.50
Foundry, oven coke	
Buffalo, del'd	$24.00
Chicago, f.o.b.	21.00
Detroit, f.o.b.	20.40
New England, del'd	23.40
Seaboard, N. J., f.o.b.	22.00
Philadelphia, f.o.b.	21.25
Swedeland, Pa., f.o.b.	21.20
Painesville, Ohio, f.o.b.	21.90
Erie, del'd	$21.04 to 21.25
Cleveland, del'd	22.63
Cincinnati, del'd	22.71
St. Paul, f.o.b.	22.50
St. Louis, del'd	21.60
Birmingham, del'd	20.20

FLUORSPAR

Washed gravel fluorspar, f.o.b. cars, Rosiclare, Ill. Base price, per ton net; Effective CaF, content:

70% or more	$37.00
60% or less	34.00

STAINLESS STEELS

Base prices, in cents per pound, f.o.b. producing point

Product	301	302	303	304	316	321	347	410	416	430
Ingots, rerolling	12.75	13.50	15.00	14.50	22.75	18.25	20.00	11.25	13.75	11.50
Slabs, billets, rerolling	17.00	18.25	20.25	19.25	30.25	24.50	26.75	15.00	18.50	15.25
Forg. discs, die blocks, rings	30.50	30.50	33.00	32.00	49.00	36.50	41.00	24.50	25.00	25.00
Billets, forging	24.25	24.25	26.25	25.50	39.00	29.00	32.75	19.50	20.00	20.00
Bars, wire, structurals	28.50	28.50	31.00	30.00	46.00	34.00	38.50	23.00	23.50	23.50
Plates	32.00	32.00	34.00	34.00	50.50	39.50	44.00	26.00	26.50-27.00	26.50
Sheets	37.50	37.50	39.50	39.50	53.00	45.50	50.00	33.00	33.50	35.50
Strip, hot-rolled	24.25	25.75	30.00	27.75	46.00	34.50	38.75	21.25	28.00	21.75
Strip, cold-rolled	30.50	33.00	36.50	35.00	55.00	44.50	48.50	27.00	33.50	27.50

Numbers correspond to producers. See Key on Steel Price Page.

STAINLESS STEEL PRODUCING POINTS—*Sheets:* Midland, Pa., 17; Brackenridge, Pa., 28; Butler, Pa., 7; McKeesport, Pa., 1; Washington, Pa., 38, 39; Baltimore, 37; Middletown, Ohio, 7; Massillon, Ohio, 4; Gary, 1; Bridgeville, Pa., 59; New Castle, Ind., 55; Lockport, N. Y., 46.
Strip: Midland, Pa., 17; Cleveland, 2; Carnegie, Pa. 41; McKeesport Pa. 54; Reading, Pa., 36; Washington, Pa., 38; W. Leechburg, Pa., 28; Bridgeville, Pa., 59; Detroit, 47; Massillon, Canton, Ohio, 4; Middletown, Ohio, 7; Harrison, N. J., 80; Youngstown, 48; Lockport, N. Y., 46; New Britain, Conn., 58; Sharon, 13; Butler, Pa., 7.
Bars: Baltimore, 7; Duquesne, Pa., 1; Munhall, Pa., 1; Reading, Pa., 36; Titusville, Pa., 59; Washington, Pa., 39; McKeesport, Pa., 1, 54; Bridgeville, Pa., 59; Dunkirk, N. Y., 28; Massillon, Ohio, 4; Chicago, 1, 67; Syracuse, N. Y., 17; Watervliet, N. Y., 28; Waukegan, Ill., 2; Lockport, N. Y., 46; Canton, Ohio, 42.
Wire: Waukegan, Ill., 2; Massillon, Ohio, 4; McKeesport, Pa., 54; Bridgeport, Conn., 44; Chicago, 67; Trenton, N. J., 45; Harrison, N. J., 80; Baltimore, 7; Dunkirk, 28.
Structurals: Baltimore, 7; Massillon, Ohio, 4; Chicago, 1, 67; Watervliet, N. Y., 28; Bridgeport, Conn., 44.
Plates: Brackenridge, Pa., 28; Butler, Pa., 7; Chicago, 1; Munhall, Pa., 1; Midland, Pa., 17; New Castle, Ind., 55; Lockport, N. Y., 46; Middletown, 7; Washington, Pa., 39; Cleveland, Massillon, 4.
Forged discs, die blocks, rings: Pittsburgh, 1, 17; Syracuse, 17; Ferndale, Mich., 28.
Forging billets: Midland, Pa., 17; Baltimore, 7; Washington, Pa., 39; McKeesport, 54; Massillon, Canton, Ohio, 4; Watervliet, 28; Pittsburgh, Chicago, 1.

REFRACTORIES (*F.o.b. works*)

Fire Clay Brick — *Carloads, Per 1000*

First quality, Ill., Ky., Md., Mo., Ohio, Pa. (except Salina, Pa., add $5) $86.00
No. 1 Ohio 80.00
Sec. quality, Pa., Md., Ky., Mo., Ill. 80.00
No. 2 Ohio 72.00
Ground fire clay, net ton, bulk (except Salina, Pa., add $1.50) 14.00

Silica Brick

Mt. Union, Pa., Ensley, Ala. $86.00
Childs, Pa. 90.00
Hays, Pa. 91.00
Chicago District 95.00
Western, Utah and Calif. 101.00
Super Duty, Hays, Pa., Athens, Tex., Chicago 106.00
Silica cement, net ton, bulk, Eastern (except Hays, Pa.) 15.00
Silica cement, net ton, bulk, Hays, Pa. 17.00
Silica cement, net ton, bulk, Ensley, Ala. 16.00
Silica cement, net ton, bulk, Chicago District 16.00
Silica cement, net ton, bulk, Utah and Calif. 22.50

Chrome Brick — *Per Net Ton*

Standard chemically bonded, balt., Chester $69.00

Magnesite Brick

Standard, Baltimore $91.00
Chemically bonded, Baltimore 80.00

Grain Magnesite — *St. ⅜-in. grains*

Domestic, f.o.b. Baltimore, in bulk fines removed ... $56.00 to $57.00
Domestic, f.o.b. Chewelah, Wash., in bulk 33.00
in sacks 38.00

Dead Burned Dolomite

F.o.b. producing points in Pennsylvania, West Virginia and Ohio, per net ton, bulk Midwest, add 10¢; Missouri Valley, add 20¢ ... $12.25

METAL POWDERS

Per pound, f.o.b. shipping point, in ton lots, for minus 100 mesh.

Swedish sponge iron c.i.f. New York, ocean bags ... 7.4¢ to 9.0¢
Canadian sponge iron, del'd, in East ..... 10.00¢
Domestic sponge iron, 98+% Fe, carload lots ..... 9.0¢ to 15.0¢
Electrolytic iron, annealed, 99.5+% Fe ..... 31.5¢ to 39.5¢
Electrolytic iron unannealed, minus 325 mesh, 99+% Fe ..... 48.5¢
Hydrogen reduced iron, minus 300 mesh, 98+% Fe ..... 63.0¢ to 80.0¢
Carbonyl iron, size 5 to 10 micron, 98%, 99.8+% Fe ..... 70.0¢ to $1.35
Aluminum ..... 31.50¢
Brass, 10 ton lots ..... 23.50¢ to 27.25¢
Copper, electrolytic ..... 27.75¢
Copper, reduced ..... 27.00¢
Cadmium, 100-199 lb $2.95
Chromium, electrolytic, 99% min., any quantity $3.50
Lead ..... 17.00¢
Manganese ..... 52.00¢
Molybdenum, 99% $2.65
Nickel, unannealed ..... 56.00¢ to 66.00¢
Nickel, annealed ..... 72.00¢
Nickel, spherical, unannealed ..... 69.00¢
Silicon ..... 34.00¢
Solder powder ... 8.5¢ plus metal values
Stainless steel, 302 ..... 75.00
Tin ..... 85.75¢
Tungsten, 99% $2.90
Zinc, 10 ton lots ..... 15.75¢ to 18.50¢

ELECTRODES

Cents per lb. f.o.b. plant, threaded electrodes with nipples, unboxed

Diam. in in.	Length in in.	Cents Per lb
GRAPHITE		
17, 18, 20	60, 72	16.00¢
8 to 16	48, 60, 72	16.50¢
7	48, 60	17.75¢
6	48, 60	19.00¢
4, 5	40	19.50¢
3	40	20.50¢
2½	24, 30	21.00¢
2	24, 30	23.00¢
CARBON		
40	100, 110	7.50¢
35	65, 110	7.50¢
30	65, 84, 110	7.50¢
24	72 to 104	7.50¢
20	84, 90	7.50¢
17	60, 72	7.50¢
14	60, 72	8.00¢
10, 12	60	8.25¢
8	60	8.50¢

PIPE AND TUBING

Base discounts, f.o.b. mills
Base price, about $200.00 per net ton

Standard, T & C

Steel, Buttweld*	Black	Galv
½-in.	40½ to 38½	24 to 22
¾-in.	43½ to 41½	28 to 26
1-in.	46 to 44	31 to 29
1¼-in.	46½ to 44½	31½ to 29½
1½-in.	47 to 45	32 to 30
2-in.	47½ to 45½	32½ to 30½
2½ to 3-in.	48 to 46	33 to 31
Steel, lapweld		
2-in.	38	22½
2½ to 3-in.	42	26½
3½ to 6-in.	43 to 40	27½ to 24½
Steel, seamless		
2-in.	36	20½
2½ to 3-in.	39	23½
3½ to 6-in.	41	25½
Wrought Iron, buttweld		
½-in.	+26½	+53
¾-in.	+16½	+42
1 & 1¼-in.	+10½	+33
1½-in.	+ 4½	+29½
2-in.	+ 4	+29
Wrought Iron, lapweld		
2-in.	+13½	+37
2½ to 3½-in.	+11	+32½
4-in.	+ 6	+26½
4½ to 8-in.	+ 8	+28
9 to 12-in.	+18	+37½

Extra Strong, Plain Ends

Steel, buttweld		
½-in.	39½ to 37½	24½ to 22½
¾-in.	43½ to 41½	28½ to 26½
1-in.	45½ to 43½	31½ to 29½
1¼-in.	46 to 44	32 to 30
1½-in.	46½ to 44½	32½ to 30½
2-in.	47 to 45	33 to 32
2½ to 3-in.	47½ to 45½	33½ to 31½
Steel, lapweld		
2-in.	37	22½
2½ to 3-in.	42	27½
3½ to 6-in.	44½ to 41½	30 to 27
Steel, seamless		
2-in.	35	20½
2½ to 3-in.	39	24½
3½ to 6-in.	42½	28
Wrought Iron, buttweld		
½-in.	+22	+47
¾-in.	+15½	+40
1 to 2-in.	+ 5½	+29
Wrought Iron, lapweld		
2-in.	+10½	+33½
2½ to 4-in.	+ 1	+22
4½ to 6-in.	+ 5	+26½
7 & 8-in.	list	+21½
9 to 12-in.	+11½	+29½

For threads only, buttweld, lapweld and seamless pipe, one point higher discount (lower price) applies. For plain ends, buttweld, lapweld and seamless pipe 3-in. and smaller, three points higher discount (lower price) applies, while for lapweld and seamless 3½-in. and larger four points higher discount (lower price) applies. On buttweld and lapweld steel pipe, jobbers are granted a discount of 5 pct.
*Fontana, Calif., deduct 11 points from figures in left columns.

BOILER TUBES

Seamless steel and electric welded commercial boiler tubes and locomotive tubes, minimum wall. Prices per 100 ft at mill in carload lots, cut lengths 10 to 24 ft inclusive.

OD in in.	gage BWG	Seamless H.R.	Seamless C.R.	Electric Weld H.R.	Electric Weld C.D.
2	13	$20.61	$24.24	$19.99	$23.51
2½	12	27.71	32.58	26.88	31.60
3	12	30.82	36.27	29.90	35.18
3½	11	38.52	45.38	37.36	43.99
4	10	47.82	56.25	46.39	54.56

CAST IRON WATER PIPE

Per net ton

6 to 24-in., del'd Chicago .. $91.80 to $95.30
6 to 24-in. del'd N. Y. ... 91.00 to 92.00
6 to 24-in., Birmingham .. 78.00 to 82.50
6-in. and larger, f.o.b. cars, San Francisco, Los Angeles, for all rail shipment; rail and water shipment less ..... $108.50 to $113.00
Class "A" and gas pipe, $5 extra; 4-in. pipe is $5 a ton above 6-in.

WAREHOUSE PRICES

Base prices, f.o.b. warehouse, dollars per 100 lb. (Metropolitan area delivery, add 20¢ to base price except Birmingham, Cincinnati, New Orleans, St. Paul (*), add 15¢; Philadelphia, add 25¢).

CITIES	SHEETS			STRIP		PLATES	SHAPES	BARS		ALLOY BARS			
	Hot-Rolled	Cold-Rolled (15 gage)	Galvanized (10 gage)	Hot-Rolled	Cold-Rolled		Standard Structural	Hot-Rolled	Cold-Finished	Hot-Rolled, A 4615 As-rolled	Hot-Rolled, A 4140-50 Ann.	Cold-Drawn, A 4615 As-rolled	Cold-Drawn, A 4140-50 Ann.
Baltimore	5.05	6.24-6.44[1]	6.46-6.46[2]	5.59-5.59[11]	....	5.20-5.64[11]	5.49	5.49-5.49[11]	6.19	9.69	9.99	11.12	11.49
Birmingham*	5.05[10]	5.80	6.15[7]	5.10[10]	....	5.20	5.05	5.00[10]	6.73	....	....	....	....
Boston	5.73	6.48[20]-6.85	6.79-7.24[21]	5.78	6.90-6.95	5.88	5.55	5.60	6.30-6.58	9.70-9.97	8.50-10.37	11.15	11.45
Buffalo	5.05	5.80	6.80	5.41	7.27	5.45	5.15	5.05	5.75	9.60	9.90	11.05	11.38
Chicago	5.05	5.80	6.70	5.10	6.60	5.20	5.05	5.00	5.65	9.25	9.55	10.70	11.00
Cincinnati*	5.32-5.07	5.80-6.24	6.29-6.39	5.49	....	5.59-5.74	5.44-5.89	5.39-5.54	6.10-6.25	9.60-9.81	9.90-10.11	11.05-11.26	11.35-11.56
Cleveland	5.05	5.80	6.95	5.24	6.35	5.32	5.17	5.12	5.75	9.36	9.66	10.81	11.11
Detroit	5.33	6.08	7.09	5.49	6.27-6.58	5.59	5.44	5.39	6.03	9.56	9.86	11.01	11.31
Houston	5.75	....	....	6.10	....	6.00	5.95	6.10	7.80	10.35-10.45	10.50-10.60	11.50	11.95-12.10
Indianapolis	....	....	....	....	7.38	....	....	....	....	....	....	....	....
Kansas City	5.65	6.40	7.30	5.70	6.95	5.80	5.65	5.60	6.35	9.85	10.15	11.30	11.60
Los Angeles*	5.80	7.30	7.50[3]	5.85	8.35[16]	5.80	5.70	5.80	7.80	10.05	10.20	11.70	12.10
Memphis	5.83	6.68	....	5.98	6.80	6.08	5.93	5.68	....	....	....	....	....
Milwaukee	5.19	5.94	6.84	5.24	6.32	5.34	....	5.14	5.89	9.39	9.69	10.84	11.14
New Orleans*	5.50[1]	6.85[1]	....	5.55[1]	6.90[1]	5.65	5.55[1]	5.55[1]	6.75	....	....	....	....
New York	5.55-5.65	6.54-6.64	6.90-7.00	5.94	6.76[3]	5.70	5.45	5.65	6.44	9.60	9.90	11.05	11.35
Norfolk	6.10	7.00	....	6.30	....	6.15	6.20	6.15	7.20	....	....	....	....
Omaha	....	....	....	....	....	....	....	....	....	....	....	....	....
Philadelphia*	5.30	6.20	6.70	5.65	6.29	5.45	5.25	5.50	6.31[32]	9.35	9.65	10.80	11.10
Pittsburgh	5.05	5.80	6.45	5.20	6.00	5.20	5.05	5.00	5.75	9.25	9.55	10.70	11.00
Portland	6.60-7.10[1]	8.40[2]	8.20[2]	6.85[9]	....	6.40[9]	6.50	6.45-6.45[9]	8.60[14]	12.00[18]	11.60[18]	....	....
Salt Lake City	5.85	6.70	6.75	7.45	8.75	6.10[3]	5.90	7.35[8]	8.75	....	....	....	....
San Francisco	6.25[11]	7.60[2]	7.50[2]	6.75[11]	7.85[16]	6.15[11]	6.00[11]	6.15[11]	7.55	10.05	10.20	11.70	12.10
Seattle	6.60[1]	8.15[2]	8.20[2]-8.35[2]	6.85[1]	....	6.35[1]	6.20[1]	6.35[4]	8.50[14]	....	11.60[18]	....	13.60[18]
St. Louis	5.38	6.13	7.03	5.43	6.68-7.54	5.53	5.38	5.33-5.35	6.08	9.58	9.88	11.03	11.33
St. Paul	5.61	6.36	7.26	5.66	6.16-6.82	5.76	5.61	5.56	6.31	9.81	10.11	11.23	11.58

BASE QUANTITIES: *(Standard unless otherwise keyed on prices).*

Hot-rolled sheets and strip, hot rolled bars and bar shapes, structural shapes, plate, galvanized sheets and cold-rolled sheets: 2000 to 9999 lb. Cold-finished bars: 1000 lb or over. Alloy bars: 1000 to 1999 lb.

All HR products may be combined to determine quantity bracket. All galvanized sheets may be combined to determine quantity bracket. CR sheets may not be combined with each other or with galv. sheets to determine quantity bracket.

Exceptions:

(1) 400 to 1499 lb; (2) 450 to 1499 lb; (3) 300 to 4999 lb; (4) 300 to 9999 lb; (5) 2000 to 5999 lb; (6) 1000 lb and over; (7) 500 to 1499 lb; (8) 400 lb and over; (9) 400 to 9999 lb; (10) 500 to 9999 lb; (11) 400 to 3999 lb; (12) 450 to 3749 lb; (13) 400 to 1999 lb; (14) 1500 lb and over; (15) 1000 to 9999 lb; (16) 6000 lb and over; (17) up to 1999 lb; (18) 1000 to 4999 lb; (19) 1500 to 3499 lb; (20) CR sheets may be combined for quantity; (21) 3 to 24 bundles; (22) 2000 lb and over.

PIG IRON PRICES

Dollars per gross ton. Delivered prices do not include 3 pct tax on freight.

PRODUCING POINT PRICES

Producing Point	Basic	No. 2 Foundry	Malleable	Bessemer	Low Phos.
Bethlehem	48.00	48.50	49.00	49.50	.....
Birmingham	41.88	42.38	.....	.....	.....
Buffalo	46.00	46.50	47.00	.....	.....
Chicago	46.00	46.50	46.50	47.00	.....
Cleveland	46.00	46.50	46.50	47.00	51.00
Duluth	46.00	46.50	46.50	47.00	.....
Erie	46.00	46.50	46.50	47.00	.....
Everett	.....	50.50	51.00	.....	.....
Granite City	47.90	48.40	48.90	.....	.....
Ironton, Utah	46.00	46.50	.....	.....	.....
Pittsburgh	46.00	46.50	46.50	47.00	.....
Geneva, Utah	46.00	46.50	.....	.....	.....
Sharpsville	46.00	46.50	46.50	47.00	.....
Steelton	48.00	48.50	49.00	49.50	54.00
Struthers, Ohio	46.00	.....	.....	.....	.....
Swedeland	48.00	48.50	49.00	49.50	.....
Toledo	46.00	46.50	46.50	47.00	.....
Troy, N. Y.	48.00	48.50	49.00	.....	54.00
Youngstown	46.00	46.50	46.50	47.00	....

DELIVERED PRICES (BASE GRADES)

Consuming Point	Producing Point	Rail Freight Rate	Basic	No. 2 Foundry	Malleable	Bessemer	Low Phos.
Boston	Everett	$0.50 Arb.	.....	50.50	51.00	.....	.....
Boston	Steelton	6.90	.....	.....	.....	.....	60.90
Brooklyn	Bethlehem	4.29	.....	52.79	53.29	53.79	.....
Cincinnati	Birmingham	6.70	48.58	49.08	.....	.....	.....
Jersey City	Bethlehem	2.63	.....	51.13	51.63	52.13	.....
Los Angeles	Geneva-Ironton	7.70	53.70	54.20	.....	.....	.....
Mansfield	Cleveland-Toledo	3.33	49.33	49.83	50.33	50.33	54.33
Philadelphia	Bethlehem	2.39	50.39	50.89	51.39	51.89	.....
Philadelphia	Swedeland	1.44	49.44	49.94	50.44	50.94	.....
Philadelphia	Steelton	3.09	.....	.....	.....	.....	57.09
Rochester	Buffalo	2.63	48.63	49.13	49.63	.....	.....
San Francisco	Geneva-Ironton	7.70	53.70	54.20	.....	.....	.....
Seattle	Geneva-Ironton	7.70	53.70	54.20	.....	.....	.....
St. Louis	Granite City	0.75 Arb.	48.65	49.15	49.65	.....	.....
Syracuse	Buffalo	3.58	49.58	50.08	50.58	.....	.....

Producing point prices are subject to switching charges; silicon differential (not to exceed 50c per ton for each 0.25 pct silicon content in excess of base grade which is 1.75 to 2.25 pct for foundry iron); phosphorus differentials, a reduction of 38c per ton for phosphorus content of 0.70 pct and over manganese differentials, a charge not to exceed 50c per ton for each 0.50 pct manganese content in excess of 1.00 pct. $2 per ton extra may be charged for 0.5 to 0.75 pct nickel content and $1 per ton extra for each additional 0.25 pct nickel.

Silvery iron (blast furnace) silicon 6.01 to 6.50 pct C/L per g.t., f.o.b. Jackson, Ohio—$57.00; f.o.b. Buffalo, $58.25. Add $1.00 per ton for each additional 0.50 pct Si up to 17 pct. Add 50c per ton for each 0.50 pct Mn over 1.00 pct. Add $1.00 per ton for 0.75 pct or more P. Bessemer ferrosilicon prices are $1.00 per ton above silvery iron prices of comparable analysis.

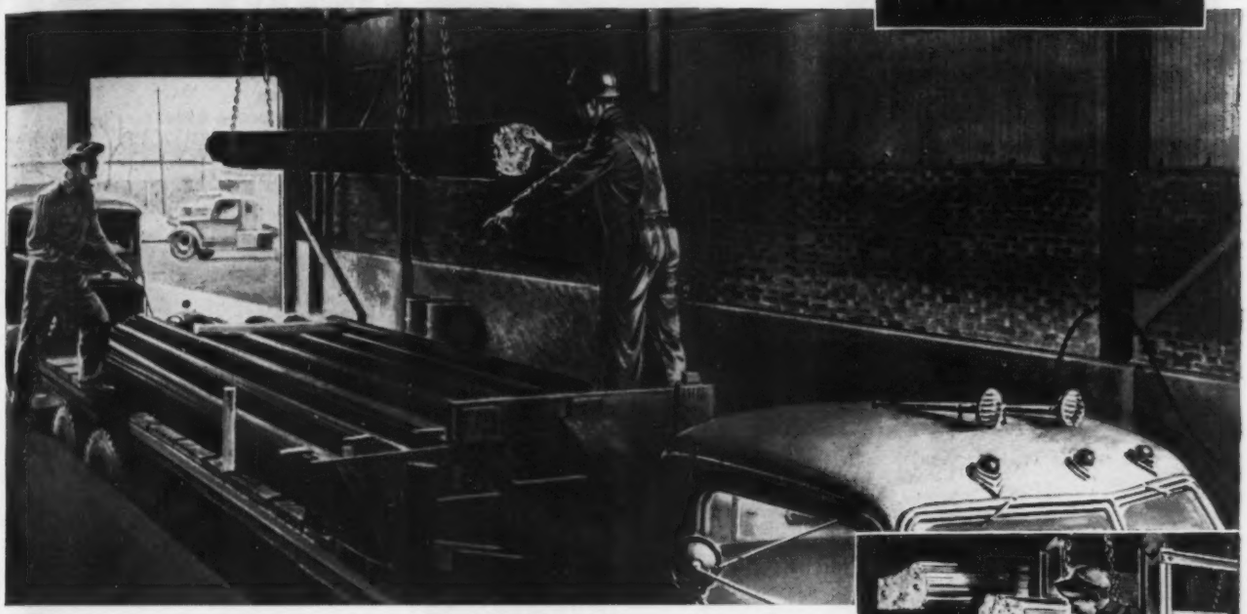
Charcoal pig iron base price for low phosphorus $60.00 per gross ton, f.o.b. Lyle, Tenn. Delivered Chicago, $68.56. High phosphorus charcoal pig iron is not being produced.

Ask Your Steel Distributor for

J&L "E" STEEL

the NEW fast-cutting bessemer screw stock

J&L STEEL



Hundreds of machine shops report . . . Longer Tool Life . . . Better Finish . . . Faster Operation—when they use J&L "E" Steel, **the amazing new bessemer screw stock** for fittings . . . nuts . . . bolts . . . shafts . . . rollers and similar products.

J&L "E" Steel is available in standard shapes and in three grades: E-15, E-23 and E-33, each within the composition limits of standard bessemer screw steels with similar tensile properties.

Your steel distributor will be glad to deliver *J&L "E" Steel.* He knows that once you start using this free-cutting steel, you'll want more.

Users have obtained machinability ratings as high as 170 with J&L "E" Steel!

Your Steel Distributor is Your STEEL SERVICE CENTER for

—QUICK DELIVERIES

—WELL-ASSORTED STOCKS

—HIGH QUALITY COLD FINISHED STEEL

Write us for the name of the nearest steel distributor of J&L "E" and other J&L cold finished steels . . . Also let us send you our new booklet: *"Faster Machining . . . Smoother Finish . . . Longer Tool Life."*

Any part machined from bessemer steel can be made better from "E" Steel.

"E" Steel (U. S. Pat. No. 2,484,231) is easily identified by the distinctive blue color on the end of every bar.

JONES & LAUGHLIN STEEL CORPORATION

From its own raw materials, J&L manufactures a full line of carbon steel products, as well as certain products in OTISCOLOY *and* JALLOY *(hi-tensile steels).*

PRINCIPAL PRODUCTS: HOT ROLLED AND COLD FINISHED BARS AND SHAPES • STRUCTURAL SHAPES • HOT AND COLD ROLLED STRIP AND SHEETS • TUBULAR, WIRE AND TIN MILL PRODUCTS • "PRECISIONBILT" WIRE ROPE • COAL CHEMICALS

Jones & Laughlin Steel Corporation
403 Jones & Laughlin Building
Pittsburgh 30, Pa.

☐ Please send me the name of the nearest J&L "E" Steel distributor.

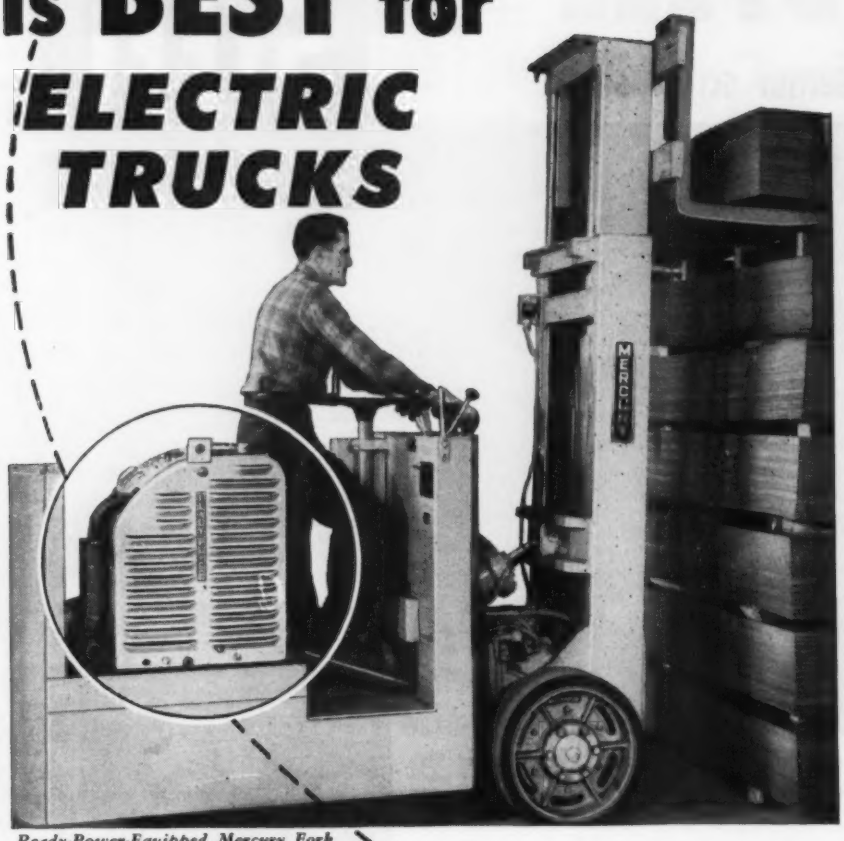
☐ Also a copy of *"Faster Machining . . . Smoother Finish . . . Longer Tool Life."*

NAME_____

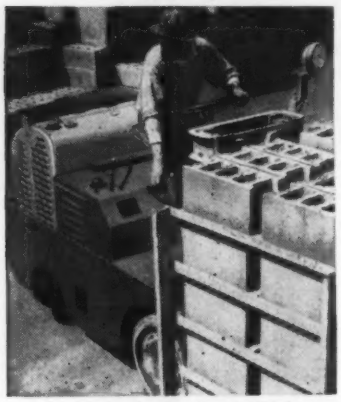
COMPANY_____

ADDRESS_____

READY-POWER is BEST for ELECTRIC TRUCKS



Ready-Power-Equipped Mercury Fork Truck



Ready-Power-Equipped Clark "Utilitruc"

BEST because Ready-Power delivers "constant-peak" electric power generated right on the chassis by the Ready-Power gas-electric Unit.

BEST because Ready-Power Units are available to fit the specifications of any electric truck manufacturer and can be installed at your request.

BEST because *only* Ready-Power can give you the constant availability of gasoline PLUS the flexibility and low maintenance of electric drive.

THE READY-POWER CO.

3822 Grand River Ave., Detroit 8, Michigan

FERROALLOYS

Ferromanganese

78-82% Mn. maximum contract base price, gross ton, lump size.

F.o.b. Birmingham	$174
F.o.b. Niagara Falls, Alloy, W. Va., Welland, Ont.	$172
F.o.b. Johnstown, Pa.	$174
F.o.b. Sheridan, Pa.	$172
F.o.b. Etna, Clairton, Pa.	$175

$2.00 for each 1% above 82% Mn, penalty, $2.15 for each 1% below 78%.

Briquets—Cents per pound of briquet, delivered, 66% contained Mn.

Carload, bulk	10.45
Ton lots	12.05

Spiegeleisen

Contract prices gross ton, lump, f.o.b.

	16-19% Mn 3% max. Si	19-21% Mn 3% max. Si
Palmerton, Pa.	$64.00	$65.00
P'gh. or Chicago	65.00	66.00

Manganese Metal

Contract basis, 2 in. x down, cents per pound of metal, delivered.

96% min. Mn, 0.2% max. C, 1% max. Si, 2% max. Fe.

Carload, packed	35.5
Ton lots	37.0

Electrolytic Manganese

F.o.b. Knoxville, Tenn., freight allowed east of Mississippi, cents per pound.

Carloads	28
Ton lots	30
Less ton lots	32

Medium Carbon Manganese

Mn 80% to 85%, C 1.25 to 1.50. Contract price, carloads, lump, bulk, delivered, per lb. of contained Mn ..... 18.15¢

Low-Carbon Manganese

Contract price, cents per pound Mn contained, lump size, delivered.

	Carloads	Ton	Less
0.07% max. C, 0.06% P, 90% Mn	25.25	27.10	28.30
0.10% max. C	24.75	26.60	27.80
0.15% max. C	24.25	26.10	27.30
0.30% max. C	23.75	25.60	26.80
0.50% max. C	23.25	25.10	26.30
0.75% max. C, 7.00% max. Si	20.25	22.10	23.30

Silicomanganese

Contract basis, lump size, cents per pound of metal, delivered, 65-68% Mn, 18-20% Si, 1.5% max. C. For 2% max. C, deduct 0.2¢.

Carload bulk	8.95
Ton lots	10.60
Briquet, contract basis carlots, bulk delivered, per lb of briquet	10.30
Ton lots	11.90

Silvery Iron (electric furnace)

Si 14.01 to 14.50 pct, f.o.b. Keokuk, Iowa, or Wenatchee, Wash., $77.00 gross ton, freight allowed to normal trade area; Si 15.01 to 15.50 pct, f.o.b. Niagara Falls, N. Y., $73.50. Add $1.00 per ton for each additional 0.50% Si up to and including 18%. Add $1.00 for each 0.50% Mn over 1%.

Silicon Metal

Contract price, cents per pound contained Si, lump size, delivered, for ton lots packed.

96% Si, 2% Fe	20.70
97% Si, 1% Fe	21.10

Silicon Briquets

Contract price, cents per pound of briquet, bulk, delivered, 40% Si, 1 lb Si briquets.

Carload, bulk	6.30
Ton lots	7.90

Electric Ferrosilicon

Contract price, cents per pound contained Si, lump, bulk, carloads, delivered.

25% Si	17.00	75% Si	13.50
50% Si	11.30	85% Si	14.65
90-95% Si			16.50

Calcium Metal

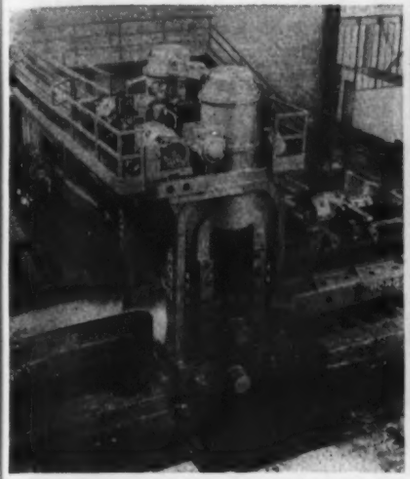
Eastern zone contract prices, cents per pound of metal, delivered.

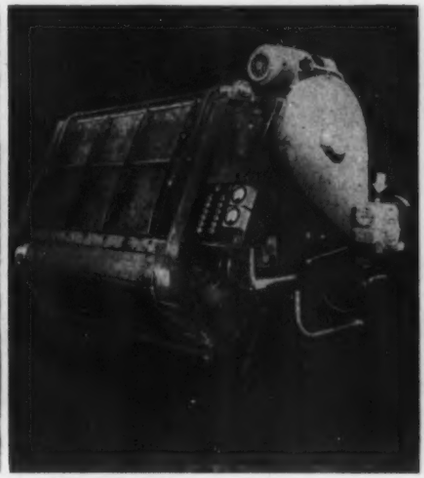
	Cast	Turnings	Distilled
Ton lots	$2.05	$2.95	$3.75
Less ton lots	2.40	3.30	4.55

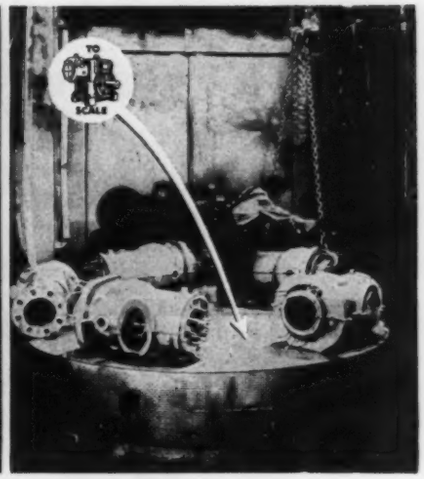
For Iron and Steel, too

CONE-DRIVE GEARS save

Space–Money–Headaches







HANDLE HEAVY DUTY LOADS

For example, this Morgan Engineering Company 40″ blooming mill, like other Morgan equipment (box-chargers, trolleys, etc.) uses Cone-Drive gears to handle the full torque heavy-duty shock loads of the screw-downs. Center distance of the gear sets is only 24 in. to handle 150 hp at 460 rpm using a mill type motor. It would take a much larger non-Cone-Drive gear set to approach the same load capacity, of course.

SAVE MONEY IN CONTINUOUS SERVICE

Wheelabrator Tumblasts know how to "take it"—the loader and mill are operated through standard Cone-Drive reducers. WHY? American Wheelabrator & Equipment Corporation says: "We use Cone-Drives for this application because they conserve space, give us freedom from service trouble and SAVE US MONEY." The unit shown (under construction) has a capacity of 30 cu. ft. of castings. The reducer is a 5″ center distance (4.6 hp at 780 rpm) Cone-Drive.

or GIVE RESERVE CAPACITY IN LIMITED SPACE

This Hydro-Blast turn-table turns 25 tons of castings at one time under high pressure streams of sand and water. Operated through a Cone-Drive double-reduction unit (600 to 1) made up of *standard* 2½″ and 5″ reducers. Over-all height is less than 19 in. Nearest other reducer would have been 26″ high. Yet the Cone-Drive reducer (shown to scale) has a torque capacity of 25,000 in.-lbs, some 11,000 in.-lbs in excess of actual requirement.

CONE-DRIVE GEARS

CONE-DRIVE GEARS

Division, Michigan Tool Company

DOUBLE ENVELOPING GEAR SETS & SPEED REDUCERS

7171 E. McNichols Road • Detroit 12, U.S.A.

don't scrap metal by turning!

...save by Swaging

on TORRINGTON SWAGERS

The Torrington Rotary Swaging Machine uses every bit of stock. With 4000 hammer blows a minute, swaging reduces, sizes, rounds, tapers and points rod, wire and tubing. It makes metal tougher and more resilient. It hammers away minor surface defects.

Torrington Swagers are built to a mechanical perfection based on our 42 years' swaging experience. Send today for your free copy of the illustrated booklet describing the machine and the method.

THE TORRINGTON COMPANY
Swager Department
555 Field Street • Torrington, Conn.

Send the coupon today for your free copy of this booklet.

Please send a copy of "The Torrington Swaging Machine" to:

Name_____

Firm_____

Address_____ 5

Ferrochrome

Contract prices, cents per pound, contained Cr, lump size, bulk, in carloads, delivered. (65-72% Cr, 2% max Si.)

0.06% C	28.75	0.30% C	27.75
0.10% C	28.25	0.50% C	27.50
0.15% C	28.00	1.00% C	27.25
2.00% C			27.00
65-69% Cr, 4-9% C			20.50
62-66% Cr, 4-6% C, 6-9% Si.			21.35

High-Nitrogen Ferrochrome

Low-carbon type: 67-72% Cr, 0.75% N. Add 5¢ per lb to regular low carbon ferrochrome price schedule. Add 5¢ for each additional 0.25% N.

S. M. Ferrochrome

Contract price, cents per pound chromium contained, lump size, delivered.

High carbon type: 60-65% Cr, 4-6% Si, 4-6% Mn, 4-6% C.

Carloads	21.60
Ton lots	23.75
Less ton lots	25.25

Low carbon type: 62-66% Cr, 4-6% Si, 4-6% Mn, 1.25% max. C.

Carloads	27.75
Ton lots	30.05
Less ton lots	31.85

Chromium Metal

Contract prices, per lb chromium contained packed, delivered, ton lots. 97% min. Cr, 1% max. Fe.

0.20% max. C	$1.09
0.50% max. C	1.05
9.00 min. C	1.04

Low Carbon Ferrochrome Silicon

(Cr 34-41%, Si 42-49%, C 0.05% max.) Contract price, carloads, f.o.b. Niagara Falls, freight allowed; lump 4-in. x down, bulk 2-in. x down, 20.50¢ per lb of contained Cr plus 11.30¢ per lb of contained Si.

Bulk 1-in. x down, 20.65¢ per lb contained Cr plus 11.50¢ per lb contained Si.

Calcium-Silicon

Contract price per lb of alloy, lump, delivered.

30-33% Ca, 60-65% Si, 3.00% max. Fe.

Carloads	17.90
Ton lots	21.00
Less ton lots	22.50

Calcium-Manganese—Silicon

Contract prices, cents per lb of alloy, lump, delivered.

16-20% Ca, 14-18% Mn, 53-59% Si.

Carloads	19.25
Ton lots	21.55
Less ton lots	22.55

CMSZ

Contract price, cents per pound of alloy, delivered.

Alloy 4: 45-49% Cr, 4-6% Mn, 18-21% Si, 1.25-1.75% Zr, 3.00-4.5% C.

Alloy 5: 50.56% Cr, 4-6% Mn, 13.50-16.00% Si, 0.75 to 1.25% Zr, 3.50-5.00% C.

Ton lots	19.75
Less ton lots	21.00

V Foundry Alloy

Cents per pound of alloy, f.o.b. Suspension Bridge, N. Y., freight allowed, max. St. Louis. V-5: 38-42% Cr, 17-19% Si, 8-11% Mn.

Ton lots	15.75¢
Less ton lots	17.00¢

Graphidox No. 4

Cents per pound of alloy, f.o.b. Suspension Bridge, N. Y., freight allowed, max. St. Louis. Si 48 to 52%, Ti 9 to 11%, Ca 5 to 7%.

Carload packed	17.00¢
Ton lots to carload packed	18.00¢
Less ton lots	19.50¢

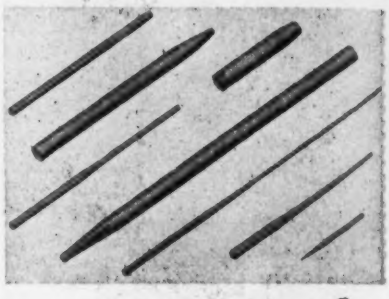
SMZ

Contract price, cents per pound of alloy, delivered. 60-65% Si, 5-7% Mn, 5-7% Zr, 20% Fe, ½ in. x 12 mesh.

Ton lots	17.25
Less ton lots	18.50

(Turn to Page 156)

YOU SAVE on parts swaged to your specifications by TORRINGTON

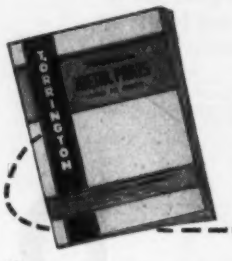


Seventy years' experience as the pioneer rotary swaging machine builder enables us to save for you on many types of hard-to-make metal parts.

Typical are surgical and dental instruments, pen and pencil barrels, soldering iron cases, etc. Medium wall tubing up to 2½" O.D. and solid steel .015" to ⅝" diameter handled.

Send your prints and specifications today for prompt quotation, and ask for a copy of "Precision Metal Parts."

THE TORRINGTON COMPANY
Specialty Department
555 Field Street • Torrington, Conn.



Send coupon today for your free copy of this booklet.

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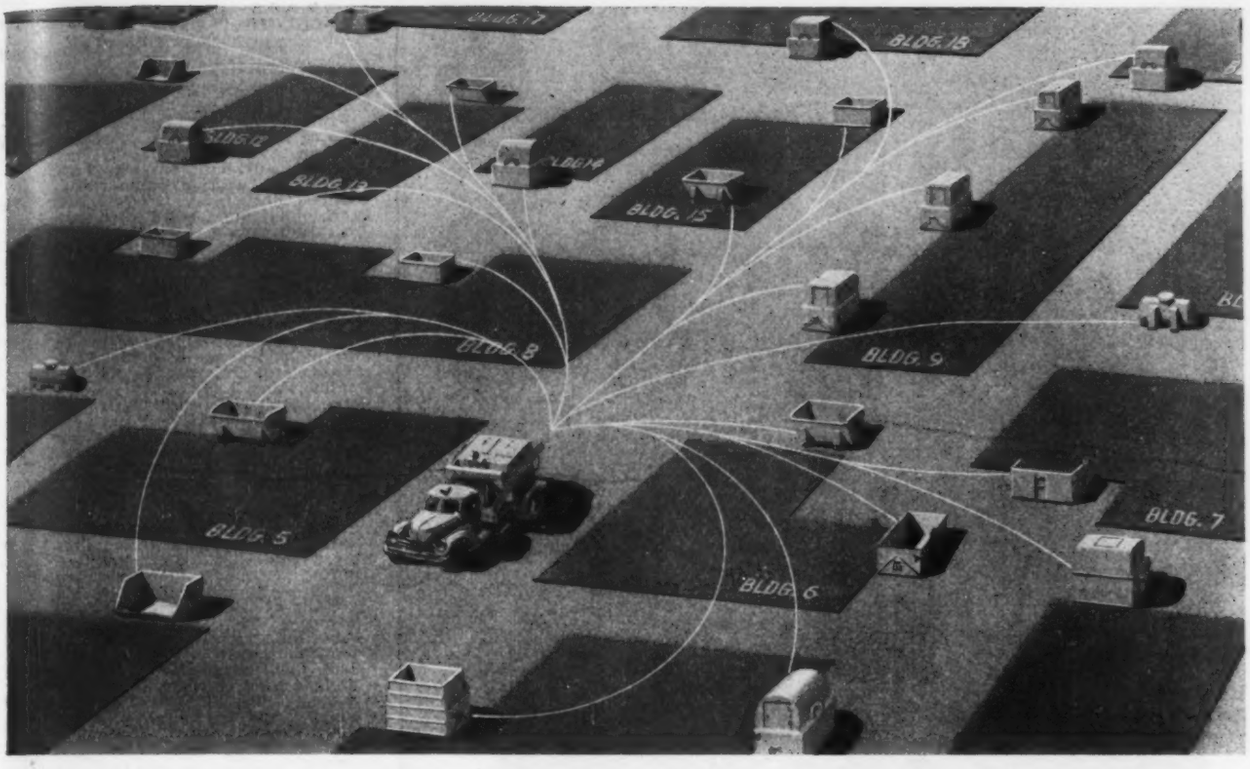


★ Never Before Have You Been Able To Cut Bulk Materials Handling Costs So Drastically

Pictured above is a skeleton layout of a typical industrial plant using the Dempster-Dumpster System — one truck mounted Dempster-Dumpster handles the entire group of 26 Dempster-Dumpster containers of six different types. These big, detachable steel containers are like having 26 truck bodies for a single truck.

Any required number of Dempster-Dumpster containers are spotted at convenient materials accumulation points inside and outside your plant. They range in sizes up to 10 cu. yds. and are made in various designs to suit your particular needs. Materials — bulky, light, heavy, solids, rubbish and even liquids—are dumped or placed in these containers. The truck mounted Dempster-Dumpster makes scheduled rounds, picks up each preloaded container, carries it to the point of disposal, sets it down intact or dumps the materials and returns the container for refilling. The entire operation is hydraulically controlled and handled by only one man, the driver.

It is not unusual for one Dempster-Dumpster to eliminate up to 10 conventional trucks . . . reducing investment accordingly. This means cutting maintenance costs, tire and gas requirements tremendously. And, more important, it increases production with a minimum of manpower. It will pay you to investigate the Dempster-Dumpster System now! A product of Dempster Brothers, Inc.

Above, the Dempster-Dumpster is shown in the three simple stages of picking-up, hauling and dumping an 8 cu. yd. drop bottom container . . . completing the cycle in one to two minutes. These photos show the ease with which the Dempster-Dumpster handles all containers, regardless of their type, size or whether they are bottom or tilt dumping types.

The important feature to remember is that only one truck-mounted Dempster-Dumpster and driver handles one container after another in an endless cycle, constantly on the move for economy and efficiency never before available in bulk materials handling.

DEMPSTER BROTHERS, 340 Dempster Building, Knoxville 17, Tennessee

Over 450 Aldrich-Groff Pumping Units—many with as much as nine years of service—are successfully operating today. And over 450 Aldrich customers have known and profited by a good investment. This service approaches that desired by Aldrich Pump designers and builders.

These many years successfully passed prove the endurance and low upkeep that are built into the Aldrich-Groff "POWR-SAVR"—a constant speed, controllable capacity pump. Its most obvious worth is usually associated with its stroke transforming action—supplying only that pressure actually needed. Less obvious is its long service economy.

For long service in the power field, for boiler or desuperheater feed, the Aldrich-Groff "POWR-SAVR" above, eliminates loss of power; and, as for mechanical reliability—there stands nine years proof of successful operation.

Send for material giving full details and ratings of Aldrich-Groff "POWR-SAVR" Controllable Capacity Pumps.

Representatives: Birmingham • Bolivar, N. Y. • Boston • Chicago • Cincinnati Cleveland • Denver • Detroit • Duluth • Houston • Jacksonville • Los Angeles New York • Omaha • Philadelphia • Pittsburgh • Portland, Ore. • Richmond, Va. St. Louis • San Francisco • Seattle • Spokane, Wash. • Syracuse • Tulsa

THE ALDRICH PUMP COMPANY

8 PINE STREET, ALLENTOWN, PENNSYLVANIA

The **FIRST** *Name in Reciprocating Pumps*

Other Ferroalloys

Alsifer, 20% Al, 40% Si, 40% Fe, contract basis, f.o.b. Suspension Bridge, N. Y.
- Carload ..... 7.65¢
- Ton lots ..... 9.05¢

Calcium molybdate, 45-40%, f.o.b. Langeloth, Pa., per pound contained Mo ..... 96¢

Ferrocolumbium, 50-60%, 2 in x D, contract basis, delivered, per pound contained Cb.
- Ton lots $3.50
- Less ton lots..... 3.55

Ferro-Tantalum-columbium, 20% Ta, 40% Cb, 0.30 C. Contract basis, delivered, ton lots, 2 in. x D, per lb of contained Cb plus Ta $2.67

Ferromolybdenum, 55-75%, f.o.b. Langeloth, Pa., per pound contained Mo $1.13

Ferrophosphorus, electrolytic, 23-26%, carlots, f.o.b. Siglo, Mt. Pleasant, Tenn., $3 unitage, per gross ton $65.00
- 10 tons to less carload..... 75.00

Ferrotitanium, 40%, regular grade, 0.10% C max., f.o.b. Niagara Falls, N. Y., and Bridgeville, Pa., freight allowed, ton lots, per lb contained Ti $1.28

Ferrotitanium, 25%, low carbon, 0.10% C max., f.o.b. Niagara Falls, N. Y., and Bridgeville, Pa., freight allowed, ton lots, per lb contained Ti $1.40
- Less ton lots..... 1.45

Ferrotitanium, 15 to 19%, high carbon, f.o.b. Niagara Falls, N. Y., freight allowed, carload per net ton $160.00

Ferrotungsten, standard, lump or ¼ x down, packed, per pound contained W, 5 ton lots, delivered $2.25

Ferrovanadium, 35-55%, contract basis, delivered, per pound, contained V.
- Openhearth $2.90
- Crucible 3.00
- High speed steel (Primos)..... 3.10

Molybdic oxide, briquets or cans, per lb contained Mo, f.o.b. Langeloth, Pa. ..... 95¢
- bags, f.o.b. Washington, Pa., Langeloth, Pa. ..... 94¢

Simanal, 20% Si, 20% Mn, 20% Al, contract basis, f.o.b. Philo, Ohio, freight allowed, per pound
- Carload, bulk, lump..... 11.00¢
- Ton lots, bulk, lump..... 11.50¢
- Less ton lots, lump..... 12.25¢

Vanadium pentoxide, 88-92% V_2O_5 contract basis, per pound contained V_2O_5 ..... $1.20

Zirconium, 35-40%, contract basis, f.o.b. plant, freight allowed, per pound of alloy.
- Ton lots ..... 21.00¢

Zirconium, 12-15%, contract basis, lump, delivered, per lb of alloy.
- Carload, bulk..... 6.60¢

Boron Agents

Contract prices, per lb of alloy, del.

Borosil, f.o.b. Philo, Ohio, freight allowed, B 3-4%, Si 40-45%, per lb contained B..... $4.25

Bortam, f.o.b. Niagara Falls
- Ton lots, per pound..... 45¢
- Less ton lots, per pound..... 50¢

Carbortam, f.o.b. Suspension Bridge, N. Y.; freight allowed, Ti 15-18%, B 1.00-1.50%, Si 2.5-3.0%, Al 1.0-2.0%.
- Ton lots, per pound..... 8.625¢

Ferroboron, 17.50% min. B, 1.50% max. Si, 0.50% max. Al, 0.50% max. C, 1 in. x D. Ton lots..... $1.20
- F.o.b. Wash., Pa.; 100 lb, up
- 10 to 14% B..... .75
- 14 to 19% B..... 1.20
- 19% min. B..... 1.50

Grainal, f.o.b. Bridgeville, Pa., freight allowed, 100 lb and over.
- No. 1 ..... 93¢
- No. 6 ..... 63¢
- No. 79 ..... 45¢

Manganese—Boron 75.00% Mn, 15-20% B, 5% max. Fe, 1.50% max. Si, 3.00% max. C, 2 in. x D, delivered.
- Ton lots $1.67
- Less ton lots..... 1.79

Nickel—Boron 15-18% B, 1.00% max. Al, 1.50% max. Si, 0.50% max. C, 3.00% max. Fe, balance Ni, delivered.
- Less ton lots..... $1.80

Silcaz, contract basis, delivered.
- Ton lots ..... 45.00¢

Resume Your Reading on Page 153

FREE

PUBLICATIONS

Continued from Page 36

are also shown. *Joseph T. Ryerson & Son, Inc. For more information, check No.* 12 *on the postcard on p.* 37.

Heat Exchangers

Ross type BCP exchangers, featuring all copper and copper alloy construction and increased heat transfer surface, are described in an 8-p. illustrated catalog. *Ross Heater & Mfg. Co., Inc. For more information, check No.* 13 *on the postcard on p.* 37.

Wheel Holders

Solid cylinder wheel holders eliminate the sulfur pot and may be quickly changed, as shown in a new 4-p. bulletin with questions and answers on this attachment for No. 11 and No. 18 Blanchard grinders. *Blanchard Machine Co. For more information, check No.* 14 *on the postcard on p.* 37.

Materials Pump

Economies in materials, labor, and product preservation in a number of industries are described in a 16-p. brochure covering the Alemite Versatal pump. *Alemite Div., Stewart-Warner Corp. For more information, check No.* 15 *on the postcard on p.* 37.

Pipe Machine

Users' comments from all over the world on the use and qualifications of the Model-A power driven pipe and bolt machine are contained in a new 4-p. folder. *Beaver Pipe Tools, Inc. For more information, check No.* 16 *on the postcard on p.* 37.

Metal Cleaning

A new 44-p. pocket size booklet reviews all phases of metal cleaning and pre-paint surface preparation and presents many useful hints on such subjects as paint stripping and anti-rust treatment. *Oakite Products, Inc. For more information, check No.* 17 *on the postcard on p.* 37.

Resume Your Reading on Page 37

120 Years Accumulated Experience To Help You Solve Welding Problems

Stainless . . . Low Alloy High Tensile . . . Non-Ferrous

Here's a picture of Arcos welding experience at work —the technical staff in a huddle over a customer's problem. They can answer more than "What electrode should I use?" Typical of the questions they answer every day are . . . "What cooling rate do you use when welding 7% chrome pipe?" "What electrode do you use for welds when operating temperatures are -40° F.? -150° F.? -320° F.?

Arcos engineers know the importance of uniformity in electrode manufacture for consistently good welding results. The many rigid production quality controls assure consistently high quality weld metal.

On that tough welding job, try Arcos electrodes and measure your savings in less rewelding. Available from nearby distributor stocks in all standard types and sizes.

ARCOS CORPORATION

1500 South Fiftieth St., Philadelphia 43, Penna.

WELD WITH

ARCOS

Specialists in Stainless, Hydrogen Controlled, and Non-Ferrous Electrodes.

Enthusiastic Customers
do our BEST advertising

Standard Pressed Steel Co., Jenkintown, Pa., uses No. 25 Grand Rapids Hydraulic Feed Surface Grinders in making the tools and dies that produce Unbrako *Socket Screw Products,* Flexloc *Self-Locking Nuts,* Hallowell *Shop Equipment.*

You will appreciate the micro-inch finish produced at production speeds on Grand Rapids Grinders. All Grand Rapids Hydraulic Feed Surface Grinders have these outstanding features:

1. One-piece column and base casting for vibrationless rigidity
2. Precision ball-bearing spindle which is greased for life
3. Bijur one-shot lubrication system eliminating hand oiling
4. Patented vertical movement of wheel head for quick, accurate adjustments
5. Portable coolant tank for ease of coolant replacement
6. Vane type hydraulic pump for fast longitudinal table travel

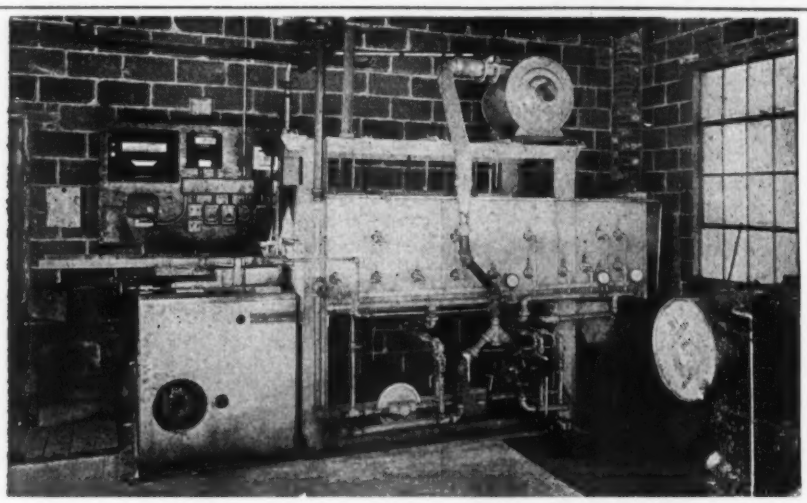
To serve you—

Your inquiry concerning your specific grinding needs will receive prompt attention. Grand Rapids Grinders include: Hydraulic Feed Surface Grinders, Universal Cutter and Tool Grinders, Hand Feed Surface Grinders, Drill Grinders, Tap Grinders, and Combination Tap and Drill Grinders.

GALLMEYER & LIVINGSTON COMPANY

GRAND RAPIDS GRINDERS

300 Straight, S. W., Grand Rapids 4, Mich.



RECIPROCATING, CONTROLLED ATMOSPHERE FURNACES

SUITED TO WIDE RANGE OF GENERAL AND ATMOSPHERE WORK

VERSATILE. A.G.F. Reciprocating Furnaces are suited to continuous clean hardening, annealing, normalizing, case-hardening by the patented Ni-Carb process, etc. Work treated in the same furnace may range from extremely small light springs, stampings, drop forgings, etc., up to quite large and heavy pieces.

THE RECIPROCATING MUFFLE advances work through the heat by its own momentum. Heat losses and maintenance problems are reduced to a minimum by the complete elimination of conveying mechanism from the heating chamber. There is no traveling belt to be alternately heated and cooled—only work enters and leaves the furnace.

Write for Bulletin 815-AB today.

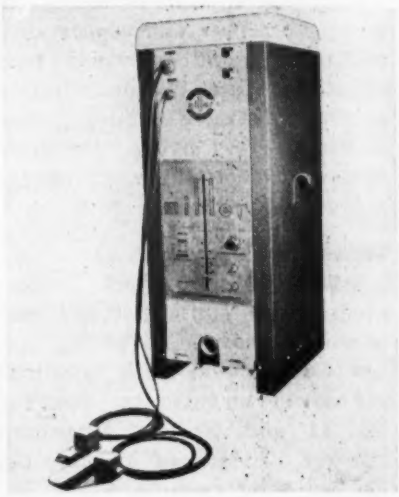
AMERICAN GAS FURNACE CO.
1004 LAFAYETTE ST., ELIZABETH, N. J.

NEW

PRODUCTION IDEAS

Continued from Page 40

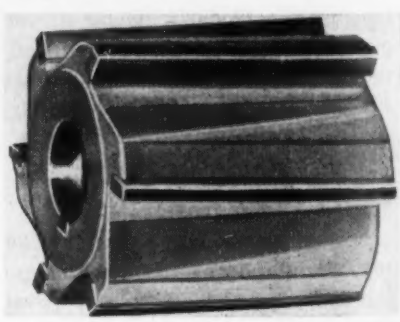
to 200, 10 to 400, and 10 to 700 amp. The A model has two foot switches, one for controlling power and high frequency, the other for



amperage control. B models have one switch for controlling the amperage. Gas and water are automatically controlled. *Miller Electric Mfg. Co. For more information, check No.* 29 *on the postcard on p.* 37.

Slab Mills

Standard carbide tipped slab mills are spiral tooth design and feature slash milled carbide tip seats and nickel shim brazing. They



are manufactured in a wide range of sizes and available in Nelco Series 300 for use on cast iron, brass and bronze, and Series 400 for aluminum, magnesium and similar metals. The large carbide

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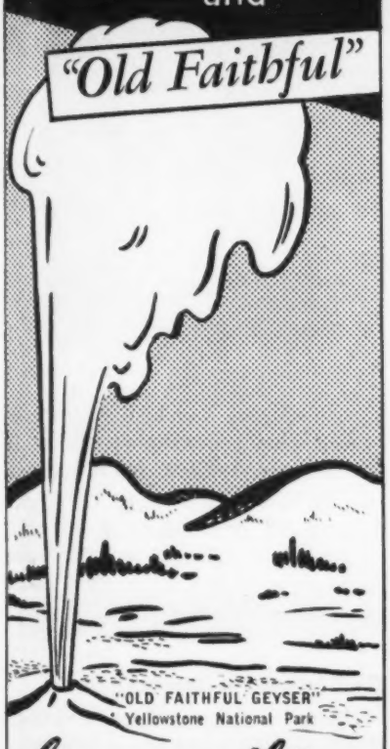

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tips overhang or protrude beyond the alloy steel body to facilitate regrinding the cutters. When properly applied these new slab mills are said to perform operations usually done with a shell mill or a face mill, and produce more pieces per grind as well as consume less power. *Nelco Tool Co. For more information, check No.* 30 *on the postcard on p.* 37.

Industrial Tractor

A new heavy duty electric industrial tractor is a two motor four-wheel drive four-wheel steer machine that develops a maximum tractive effort of 4000 lb. Light travel speed is 6 mph and the tractor chassis weight, less power source, is 4700 lb. The recommended power source is a battery

of 48 v and not less than 450 amp-hr rating. The tractor, less coupler, is 84 in. long, 44 in. wide x 66 in. high. Each of the separately powered drive axles is fully enclosed double reduction spiral bevel and spur gear type with heavy duty automotive differential. A four speed magnetic contactor travel controller has an automatically controlled foot accelerator. *Mercury Mfg. Co. For more information, check No.* 31 *on the postcard on p.* 37.

Offset Former

Circumferential seams on tanks and cylindrical shapes up to 7/16 in. thick can be welded automatically without back-up bars or manual back-up, by a newly developed offset process. The forming machine produces an offset at the ends of the shell section over which the tank heads or other shell

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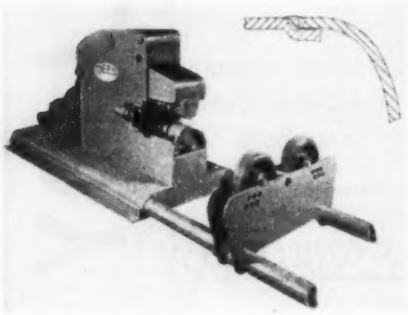
sections can be fitted for automatic welding. The machine, equipped with hardened steel forming rolls, uses hydraulic power for the offsetting pressure. With standard forming rolls, material ranging



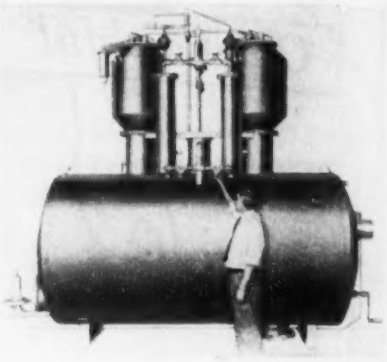
from 3/16 to 7/16 in. thick can be handled. Minimum diameter handled is 24 in.; maximum diameter depends upon the rigidity of the shell and material handling equipment available. Floor space requirements are 4x8 ft. *Reed Engineering Co. For more information, check No.* 32 *on the postcard on p.* 37.

Toolpost-Bench Grinder

Said to be accurate to 0.0002 in., the ¼ hp, 5000 rpm utility grinder fits lathes of 9 to 13 in. swing for external cylindrical grinding, mounts on shaper, planer or milling machine for surface grinding. It quickly converts to bench use for burring castings, cleaning welds, wire brushing, polishing and tool sharpening. *Dumore Co. For more information, check No.* 33 *on the postcard on p.* 37.

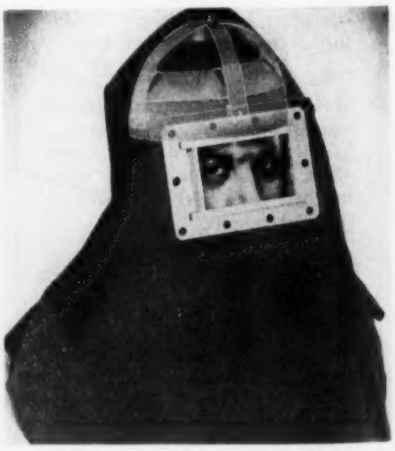
Acetylene Generator

A new stationary generator that produces a continuous flow of acetylene and is virtually automatic in its operation uses ¼ x 1/12 calcium carbide in the production of acetylene. Compactly built to occupy a minimum of space within the shop or generator house, the model supplies acetylene to points of usage throughout the plant by pipe line distribution. Refilling hopper with calcium carbide when empty and metering required amount of water into the tank are the only two simple manual operations needed. The unit can be operated at any pressure up to 13 psi. The A-Twin is manufactured in five sizes, producing from 500 to 2400 cu ft of acetylene per hr. *Sight Feed Generator Co. For more information, check No.* 34 *on the postcard on p.* 37.



Rubberized Hood

Coated with an improved rubber, the fabric in the new safety hood is impervious to moisture, most acids, caustics, oils, and solvents and protects against extreme temperature and light metal splashes. Flexibility is retained for long, durable life. The rubberized hood is fitted with a large plastic window for easy visibility and protects the worker's face, head and neck. A supporting frame in the hood increases comfort. *General Scientific Equipment Co. For more information, check No.* 35 *on the postcard on p.* 37.



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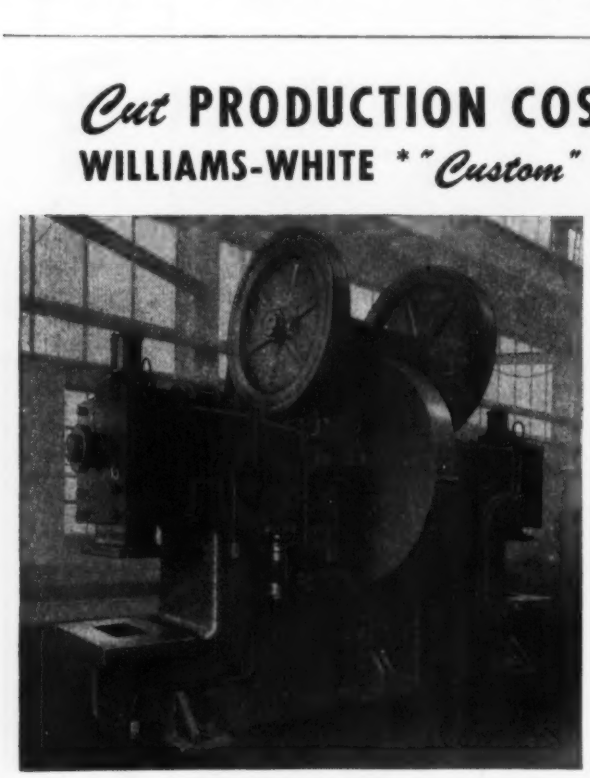

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Samples of AlSiMag Strainer Cores from sizes in stock are sent free on request. Test samples made to your specifications at reasonable cost. Write for samples. Test them in your own foundry. Keep a record of the results. You will see, as other foundries have, that AlSiMag Strainer Cores pay for themselves many times over.

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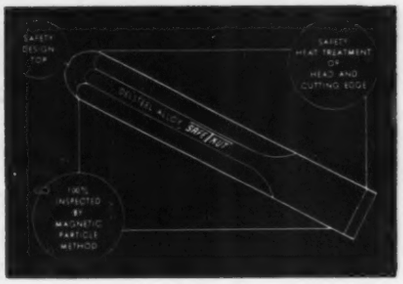
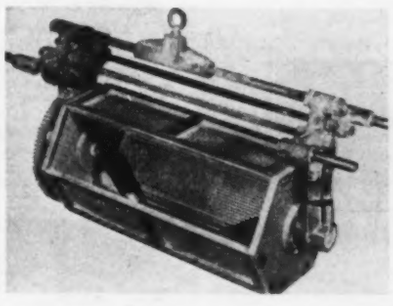
Tools in the Safe-T-Kut line consist of hand chisels, pneumatic and electric hammer chisels, center punches, paving breaker steels, back-out punches and blacksmith's tools. They are made from Delsteel Alloy and incorporate special features that stress safety in use. Magnetic particle inspection of each tool reveals any defects such as



laps, seams, forging, grinding, or heat treating cracks not discernible to the eye. Special design of the striking end of hand tools removes much of the metal coming in contact with the striking hammer, resulting in a diminished tendency of the tool to spall or mushroom. *Delaware Tool Steel Corp. For more information, check No.* 36 *on the postcard on p.* 37.

Barrel Plating Cylinder

A Mercil type Merlon ribless cylinder, 14x30 in. is hexagon shape, the body made up of five covers. It has no ribs, no tie rods and no tie rod tubing. Merlon sheet



stock is utilized for the covers with a dovetailed slot milled along the edge of each cover. Joining is made by a dovetailed piece of Merlon driven into each slot. The cylinder employs flexible dangler, hair pin dangler or disk type contacts. *Hanson - Van Winkle - Munning. For more information, check No.* 37 *on the postcard on p.* 37.

Resume Your Reading on Page 41

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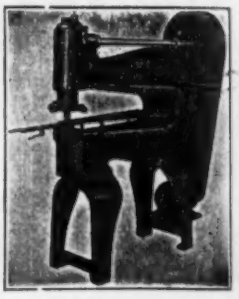

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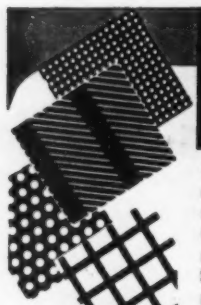

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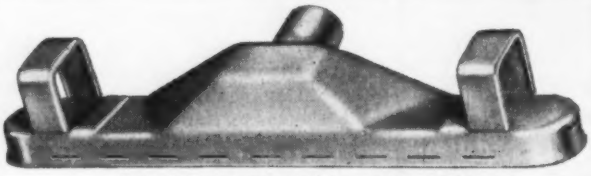

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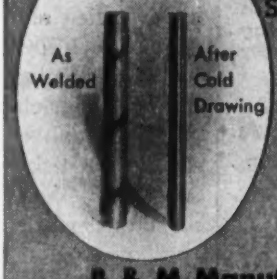

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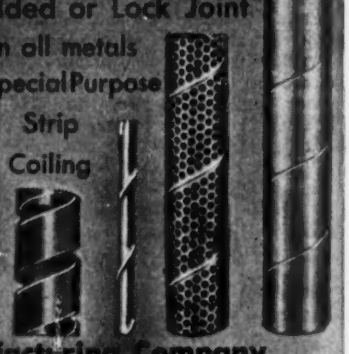

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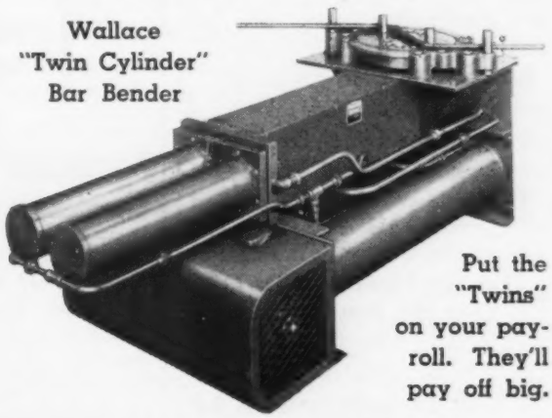

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Boring Mills, 24"-36"-42"-52".
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NEWS OF USED, REBUILT AND SURPLUS MACHINERY

Government defense orders stimulate Cleveland used machinery activity

New Haven used dealers enjoy fair to good activity level

Philadelphia expects capital equipment outlays of $45 million in 1950

Rearmament Orders Stimulate Cleveland Machinery Business

Cleveland—Most dealers in this area report that their activity is from fair to good, and has been for the past few months. These dealers claim that government defense and rearmament orders are the stimulating factors. Both toolroom and production items are said to be experiencing an active demand. The only limitations to business in this area are machine availability and price.

Cleveland dealers report that precision toolroom lathes, mills and grinders are snapped up when they can be had. In production line machines, large lathes, punch presses, vertical and horizontal mills, and 60 to 100-ton openbach inclinable presses are moving well. Some dealers report that automatic screw machines are again in demand.

Used Machinery Activity At Fair Level in New Haven Area

New Haven — Dealers in this area report that used machinery activity is as good as or better than it was at the first of the year. Some dealers claimed a slow steady increase in activity from the first of the year. Others have noticed a decided spurt in activity during the month of March. Reports from most dealers show that inquiries and sales have increased from 20 to 50 pct since the start of 1950.

As usual, late type production units are getting the most play. Occasionally, it is reported, small operators shopping strictly for price take one or two old models off the floors of the dealers.

As an example of how dealers are improving their family relations, four machinery firms in the Connecticut area have bought and are working together in the liquidation of the production units of a medium sized manufacturing firm. The machine units being sold are said to be moving well.

Philadelphia Equipment Sales Estimate is $45 Million in 1950

Philadelphia — Expenditures of $45 million for equipment during 1950 are expected in this area as a result of a recent survey conducted by the Federal Reserve Bank of Philadelphia. The survey also revealed the following facts:

Outlay for new plants in this area have reached a leveling-off point. The amount spent for construction in 1949 was $43 million. This has dropped to an estimated $39 million for 1950.

Readjustment Not Complete

Readjustment in demand for new equipment has not yet been completed. This is revealed by the fact that outlays for equipment are apparently going to be about one-third less than last year. In actual figures, the Philadelphia expenditures for equipment in 1949 amounted to $68 million. Proposed scheduling calls for $45 million in 1950.

The Philadelphia manufacturing center is fighting for a more favorable competitive position with the recently equipped indus-

Turn to Page 170

EASTERN OFFERS FROM STOCK

AUTOMATICS
No. 4D Potter & Johnston, m.d., latest
1 spindle 1⅝" Cone, m.d., latest
4 spindle 1¼" Conomatic, m.d., bar, 1942 machine
4 spindle 1½"x4" Conomatic, m.d., bar, 1942 machine
No. 6A Potter & Johnston, m.d.
No. 6C Potter & Johnston, m.d.
14" Fay Flanders Type, m.d.
20x35" Jones & Lamson, m.d., latest
4 spindle 2¼" Cleveland Model "K", m.d.
2¼" Gridley Single Spindle, m.d.
1⅝" Cleveland Model A, m.d.
6¼" Cleveland Model A, m.d.
4½" Cleveland Model A, m.d.
5½" Cleveland Model A, m.d.
8" Cleveland Model A, m.d.
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HORIZONTAL BORING MILLS
No. 0 Giddings & Lewis, m.d., 3⅛" bar
3¼" Cincinnati-Gilbert Floor Type, m.d.
No. 25T Giddings & Lewis, m.d., 2½" bar, latest
No. 21 Lucas, 3" bar, m.d.
4" bar Detrick & Harvey Floor Type, m.d.
5¼" bar Niles, m.d.
10" bar Sellers Floor Type, m.d.

VERTICAL BORING MILLS
24" Bullard New Era, m.d., with side head
36" Bullard New Era, m.d., with side head
42" Bullard New Era, m.d., with side head
42" Bullard Spiral Drive, m.d., with side head
42" Colburn H.D., m.d., 2 swivel heads
42" Colburn, m.d., 1 swivel head, 1 turret head, p.r.t.
42" King, belted m.d., 2 swivel heads, p.r.t.
42" King, m.d., 1 turret head, 1 side head
48" Colburn H.D., m.d., 1 turret head, 1 swivel head
48" Putnam H.D., m.d., 2 swivel heads
54" Colburn, m.d., 1 turret head, 1 swivel head
100" Niles Heavy, m.d., 2 swivel heads, p.r.t.
100" Niles Extra Heavy, m.d., p.r.t., late
120" Niles Heavy, m.d., 2 swivel heads, p.r.t.

BROACHING MACHINES
No. 4 Oil Gear Hydraulic, m.d., 64" stroke
75 H.P. LaPointe Horizontal Hydraulic, 150" stroke, 37½ tons cap.
Cincinnati Mill Broach, m.d., 10" spindles, new

BALL BEARING DRILLS
Model D-1100-B Walker-Turner Bench Type, 20" size, brand new

No. ½, 1, 2 Avey, belted m.d.
No. 1B Edlund, m.d., new
No. 2—12" Foote-Burt Single Spindle, m.d.
No. 2LMS Leland-Gifford, m.d., Deep Hole Drill, latest
No. 3 Allen, belted m.d., 12" overhang, No. 3 Taper
No. 4 Fosdick, 8" overhang, belted m.d., No. 2 Taper
No. 4BM-24" Fosdick, m.d., latest
No. 5M-16" Fosdick, m.d.
1 spindle No. 3 Avey Type B, style MA6, m.d., No. 3 Taper, latest
2 spindle 20" Canedy-Otto, m.d., No. 4 Taper
2 spindle No. 3 Avey, belted m.d., p.f.
3 spindle No. ½ Avey Heavy, direct m.d., latest
4 spindle No. 2 Avey, belted m.d.
4 spindle No. 2LMS Leland-Gifford, 26" swing, m.d. on each spindle
4 spindle No. 2 MA6 Avey High Speed, m.d. on each spindle, No. 2 Taper
6 spindle No. ½ Avey, Model MA8, m.d., latest
6 spindle Leland & Gifford, No. 2 Taper, m.d. on each spindle
6 spindle 2B Edlund, m.d., No. 2 Taper
6 spindle No. 3 Avey, belted m.d.
6 spindle Henry & Wright, m.d., 15" overhang, No. 2 Taper

HORIZONTAL DRILLS
Morris Horizontal Mor-Speed, m.d.
No. ⅛Bx30" Pratt & Whitney 2 spindle Deep Hole Reaming Machine, m.d.
No. ⅛Bx50" Pratt & Whitney Gun Barrel Rifling Machine, m.d., latest
No. ⅛Bx50" Pratt & Whitney Chambering Machine, m.d., latest
No. 1Bx74" Pratt & Whitney 2 spindle Deep Hole Reaming Machine, m.d., latest
No. 1½x105" Pratt & Whitney 2 spindle Deep Hole Drill, m.d., latest
No. 1½x105" Pratt & Whitney 2 spindle Gun Barrel Rifling Machine, m.d.
No. 1 Pratt & Whitney 2 spindle Deep Hole Drill, belted m.d.
No. 1½ Pratt & Whitney 2 spindle, m.d., older type
Pratt & Whitney Rifling Machine, belt
5 spindle Detroit Semi-Automatic Drill, belt
2 spindle No. 410 W. F. & John Barnes Deep Hole Drill, m.d.

MULTIPLE SPINDLE DRILLS
No. 3 Baush, m.d., 16x30" head, 15 spindles
No. 3 Baush, m.d., 20x40" head, 15 spindles
P7 Baush Hydraulic, m.d., 20x30" head, 12 spindles, latest
D13H Natco Hydraulic, m.d., 18x12" head, 10 spindles
No. 16 Foote-Burt Fixed Center, m.d.
2 spindle 21" Cincinnati-Bickford, m.d., No. 3 Morse Taper
3 spindle 24" Barnes All Geared Self-Oiling, m.d.
3 spindle 12" Rockford Gang, m.d.
4 spindle Foote-Burt Rail, No. 4 Taper, m.d.
4 spindle Niles-Bement-Pond H.D. Rail, m.d., 12' rail, No 5 Taper

RADIAL DRILLS
3' American Sensitive, cone
3'-9" Cincinnati-Bickford, m.d., latest
3'-9" Morris, m.d. on arm, latest
3½' Triple Purpose American, gear box on base
4'-9" Cincinnati-Bickford, m.d., latest
4'-13" American, gear box
4' Niles-Bement-Pond Semi-Universal, m.d.
5' American Triple Geared, 13" col., gear box
5'-11" Carlton, m.d. on arm, latest
5'-13" Cincinnati-Bickford, m.d.
5'-14" American Triple Purpose, m.d. on arm
5' Cincinnati-Bickford Full Universal, gear box
5' Cincinnati-Bickford Plate Hole Driller, m.d. on arm
5' Prentice, m.d., Plain
6'-15" American Hole Wizard, m.d. on arm
6'-15" Carlton, gear box, inclosed head
6'-15" Cincinnati-Bickford, with 7' arm, m.d.
6' Niles-Bement-Pond Semi-Universal, m.d.
6'-16" Western, m.d.
6'-17" American Triple Purpose, m.d. on base
7'-17" Dreses, gear box, m.d.
8'-16" American Triple Purpose, m.d. on arm
10'-22" American Triple Purpose, m.d. on arm

UPRIGHT DRILLS
No. 1 Minster Hi-Duty, m.d.
20" Barnes All Geared, m.d., tapper
21" Cincinnati-Bickford, m.d., tapper
24" Cincinnati-Bickford, m.d.
25" Fosdick, H.D., s.p.d.
30" Rich H.D., m.d.
D4 Colburn H.D., m.d.
D8 Colburn, H.D., m.d.
No. 25 Foote-Burt, m.d.
No. 36HO Baker H.D., m.d.
No. 217 Baker H.D., s.p.d.
B225H Natco H.D., m.d.
C225H Natco H.D., m.d.

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#2 Morse Taper, ⅝" Drilling Capacity, Hand Feed to Spindle. 1942 MODELS PRACTICALLY NEW
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200 steel work tables, 5 ft. wide, 10 ft. long, 34 in. high. Collapsible $10.00 each.

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4⅜" Conomatic 4 spindle, serial No. 2191K with, reel, chip conveyor, extra equipment.

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15 ton 36" stroke American vertical duplex surface with tilting type workholder.

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42 spindle, No. B16 Natco multiple with 18" x 48" drilling area and two box tables.

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Type T Barber Colman. Designed for either straight or taper splines, helical or spur gears. Also type A and Nos. 3 & 12 Barber Colmans.

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6" x 18", No. 10 Brown & Sharpe "Electric Hydraulic" Three with and two without spindle oscillation. New 1940 and 1941.

10" x 36" Norton type C hydraulic with hydraulic quick in-feed. Serial No. C16458, new in 1942.

10" x 72" Norton type C hydraulic made at factory to swing 14". Serial No. 21750, new in 1944.

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350 ton Clearing Crankless, model F1350-42, serial No. 45-11155P, new 1945. 20" stroke, 28" shut height, 36" x 42" bed.

600 ton Hamilton No. 2316½ eccentric shaft forging. Stroke 4"; shut height 16" bed 28" F to B x 23¾" R to L.

No. 506 Bliss on inclined legs with double roll feed and scrap cutter. About 126 tons. 3" stroke, 11½" shut height.

1000 ton Baldwin Southwark "Hy-Speed" hydraulic. 20" stroke, 56" daylight, bed 42" F to B x 54" R to L.

UPSETTERS

2" National. Serial No. 13213. Has suspended slides with long overarm guide. Has 15 HP motor.

4" Ajax. Serial No. 3156. Has twin drive gears, suspended slides, self contained backshaft, 30 HP motor.

MILES MACHINERY CO.
SAGINAW, MICH.

Continued from Page 166

trial centers of the West and South. Local manufacturers are therefore planning to spend more on equipment than on construction in the year to come. Emphasis is upon plant modernization rather than expansion of floor space.

Estimates Are Reliable

These estimates have enjoyed a high reliability. September 1948 predictions indicated an outlay of $113 million for equipment and construction for 1949. Actual figures amounted to $111 million, which is within 2 pct of the estimate. Results have shown that the forecasts are good on the whole, not necessarily in the parts.

It was also pointed out that the Philadelphia figures could not be regarded as a reliable nationwide barometer. Manufacturing industries throughout the nation attained their peak dollar volume of capital expenditures in 1948. In Philadelphia the peak occurred a year earlier, and the rate of decline after that time was much sharper than that of the rest of the nation.

MDNA Will Distribute Price-Serial Book at 1950 Convention

Chicago—It has been announced that the MDNA Price & Serial Book on machine tools will be ready for delivery to members in good standing at the 1950 convention. It is planned to hold the convention at the Statler Hotel in Detroit on May 10, 11, and 12.

The successful preparation of the MDNA Price & Serial Book was accomplished mainly through the efforts of Robert Bryce of Bryce-Rankin Machinery Co., Detroit, Harvey Goldman of Harvey Goldman & Co., Dearborn, and Benjamin Weiss of Machinery Liquidating Co., Detroit.

This book, the first thorough and comprehensive compilation of the machine tools of the nation's manufacturers since the OPA-MDNA serial book, is regarded by most members to be worth more than the yearly dues to the Association.

Resume Your Reading on Page 167

132" x 1½" MORGAN PLATE SHEAR, 26" Throat, Hold-down, Motor Drive.

100" RIDGWAY BORING MILL, 2 Heads, Rapid Power Traverse.

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6'-17" Carlton Radial Drill
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